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DISEASES CAUSED BY BACTERIA AND FUNGI

Derbyshire, J. B. (1960). **Studies in immunity to experimental staphylococcal mastitis in the goat and cow.**—J. comp. Path. 70, 222-231. [Author's conclusions modified.] 2768

Serum staphylococcal antibody levels were higher and persisted longer in two goats vaccinated with *Staph. aureus* strain 201 formolized cell-toxoid with aluminium hydroxide gel than in pairs of goats vaccinated with simple formolized cell-toxoid, cells alone, toxoid alone or with a formolized whole broth culture.

The adjuvant cell-toxoid conferred a high level of protection in five goats against intramammary inoculation of 10^9 living staphylococci of the homologous strain; they had mild transient reactions compared with gangrenous mastitis in the controls. This vaccine conferred a like degree of protection on four cows similarly challenged.

Pagano, J. S., Farrer, S. M., Plotkin, S. A., Brachman, P. S., Fekety, F. R. & Pidcoe, V. (1960). **Isolation from animals of human strains of staphylococci during an epidemic in a veterinary school.**—Science 131, 927-928. [Authors' summary.] 2769

Antibiotic-resistant staphylococci of the same bacteriophage type were isolated from the external nares of asymptomatic domestic animals and from human beings during an epidemic of staphylococcal disease in veterinary students. Not all of the infections could be attributed to person-to-person contact; spread could be explained also by transmission of staphylococci from animals.

Smith, H. Williams & Crabb, W. E. (1960). **The effect of diets containing tetracyclines and penicillin on the *Staphylococcus aureus* flora of the nose and skin of pigs and chickens and their human attendants.**—J. Path. Bact. 79, 243-249. [Authors' summary modified.] 2770

Antibiotic-sensitivity of *Staph. aureus* isolated from the nose and skin of pigs and chickens kept under commercial conditions and from their attendants was tested.

Resistant strains were much more prevalent in animals on diets containing antibiotics than, in those on diets without antibiotics. This applies also to their attendants.

Phage typing and other tests showed that the antibiotic-resistant strains from the attendants were usually identical with those from their pigs.

Foster, W. D. (1960). **Environmental staphylococcal contamination. A study by a new method.**—Lancet March 26th, 670-673. [Author's summary.] 2771

A new method of assessing environmental contamination by staphylococci is described, and an account is given of its use in investigating an outbreak of staphylococcal wound sepsis and in devising effective measures for disinfecting wards.

Weld, J. T. & Rogers, D. E. (1960). **Staphylococcal immunity: production of staphylococcal hemagglutinins in rabbits receiving staphylococcal vaccine.**—Proc. Soc. exp. Biol., N.Y. 103, 311-314. 2772

Rabbits given weekly i/v injections of killed staphylococci formed haemagglutinins which reached their highest titre after 30-40 days. The haemagglutination test was performed with a 1.25% concentration of r.b.c. and undiluted antigen prepared from homologous 18-hour-old cultures killed by heat. Variations in the concentration of r.b.c. or in the antigen caused discrepant results.—M.G.G.

Stevens, O. R. (1960). **Use of a bacterin in the control of bovine mastitis in problem herds.**—Allied Vet. 31, 36-39. [Author's summary modified.] 2773

A mixed vaccine prepared from killed

Staph. aureus, *Strept. agalactiae* and *E. coli* was used in six herds to obtain information on its effect on mastitis as determined by the California test and by clinical examination. 25 ml. were given s/c and injection was repeated at an interval of 7 to 14 days, thereafter at 6-month intervals. The incidence of clinical mastitis was three times greater in untreated controls. The vaccine appeared to be most effective in younger cows, or those in which udder infections had not become well established.

Okada, M. (1959). **Histology of the mammary gland. VI. Effects of ACTH on the cell count in milk and in various organs of milking goats.**—Tohoku J. agric. Res. 10, 369-377. [In English. Author's summary modified.] **2774**

The lymphoid cell and eosinophile counts in the circulating blood decreased during two to three days following the pituitary graft and during six to 12 hours following the ACTH injection, and neutrophile count increased during the same period.

The lymphoid cell and neutrophile counts in the secreted whole milk and in the mammary glands increased during the same period mentioned above.

The numbers of degenerating lymphoid cells in thymus, spleen and lamina propria of the intestine increased at three days following the pituitary graft or at 12 hours following the ACTH injection.

The data suggest that in normally milking goats the lymphoid cells and neutrophiles are released into the secreted milk under the stimulation of the pituitary-adrenocortical system.

Rømer, O. (1960). **A comparison between pneumococcal infection in calves and man with special reference to the possibility of a causal relation.**—Nord. VetMed. 12, 73-85. [In English. Summaries in German and Danish.] **2775**

R. compared the incidence of 17 types of *Streptococcus pneumoniae* in calves and in animal attendants in 41 herds. Throat swabs from 165 animal attendants were examined. Pneumococcus was isolated in 72 cases. In 49 of the 72 cases the types of pneumococcus were those associated with illness in calves; in 28 cases the same type was found in human beings and in calves on the same farm. The findings confirm those of Hammer [V.B. 26,

681] and other authors that human beings are apparently the source of pneumococcus infection in calves.—R.M.

I. Stanley, J. L., Sargeant, K. & Smith, H. (1960). **Purification of factors I and II of the anthrax toxin produced in vivo.**—J. gen. Microbiol. 22, 206-218. **2776**

II. Sargeant, K., Stanley, J. L. & Smith, H. (1960). **The serological relationship between purified preparations of factors I and II of the anthrax toxin produced in vivo and in vitro.**—Ibid. 219-228. [Authors' summaries modified.] **2777**

I. Highly labile factors (I and II) of anthrax toxin were purified from the toxic plasma of g.pigs just dead from anthrax, by fractionation methods involving the minimum of inactivation. The final preparations of factors I and II, which still contained constituents of g.pig plasma, were toxic when injected together but innocuous when injected separately.

II. A serological comparison on gel-diffusion plates of preparations of factors I and II of the anthrax toxin obtained *in vitro* and *in vivo* indicated that all except one (factor I from *in vitro* sources) contained at least two major serological components. At least three serological components were involved in the total system: A (associated with factor I activity); B (associated with factor II activity); C (not associated with toxic activity). These results indicated that no preparation of factor II of the anthrax toxin so far examined was immunologically homogenous and that the serological connexion between factor I of the anthrax toxin (produced *in vivo*) and the protective factor produced *in vitro* (Smith, 1958) was due to a common component not associated with factor I activity. There was some evidence that the method of measuring immunogenicity in certain culture filtrates of *Bacillus anthracis* by serological precipitation (Thorne & Belton, 1957) is not generally applicable to all products of this organism.

Richter, W. (1960). Beiträge zur Tuberkulose-Diagnostik des Pferdes. (I). [Diagnosis of tuberculosis in horses. I.] — Arch. exp. VetMed. 14, 60-74. **2778**

Simultaneous intradermal tests with 0.1 ml. (7,500 units) of bovine and of avian tuberculin were performed on 40 horses at intervals of 2-4 months in the course of a year. In the initial test some horses developed strong reactions of up to 21 mm. in diameter; they were larger for avian than bovine tuber-

culin, and decreased in later tests. The lymphatics were not involved. In a series of Middlebrook-Dubos haemagglutination tests, 25 of 39 horses had a titre of 1: 40 or over in the first test, performed a month after the first tuberculin test, compared with one of 39 ten months later. Of 39 horses given a drop of tuberculin in each eye, 17 developed whitish flakes the size of a lentil in the corner of the eye. But as there was no purulent discharge, the reaction was considered to be non-specific. Four horses with the strongest tuberculin reactions were slaughtered, but no signs of TB. were found. It was concluded that tuberculin should be diluted for use in horses, to obviate non-specific reactions.

—M.G.G.

McKay, W. M. (1959). A clinical study of bovine tuberculosis in Banffshire. The pathological lesions, Parts I & II.—*Brit. vet. J.* 115, 324-329 & 370-377. **2779**

TB. as seen in its rampant days more than 10 years ago is described from data collected over a 10-year period from 1,090 P.M. examinations on tuberculous cattle in Banffshire. The data include a description of the lesions, the organs involved, deductions regarding the mode of dissemination and comparisons with corresponding data for TB. in man. Tuberculous mastitis, the most important clinical manifestation, was found in 0.4% of the dairy cows in Banffshire, in all except one case as a result of generalized disease. The commonest site of TB. was the bronchial and mediastinal lymph nodes (89% of cases); the lungs showed lesions in 80%. Pulmonary TB. was rarely chronic. Involvement of the alimentary tract, liver, spleen, peritoneum, pleura and trachea was fairly frequent but disease of the heart, kidneys, bones and joints, accessory lymph nodes, tongue, eyes and c.n.s. was less common. 16 congenital cases were found (incidence 0.02%): lesions in the uterus of the dam were evident in the 8 cases examined.

—A. ACKROYD.

Sever, J. L. (1960). Passive transfer of resistance to tuberculosis through use of monocytes.—*Proc. Soc. exp. Biol., N.Y.* 103, 326-329. [Author's summary modified.] **2780**

Experiments are reported which demonstrate passive transfer of a limited degree of increased resistance to TB. through use of monocytes from immunized animals. Use of monocytes from normal animals had no effect on resistance. No increased resistance was

seen in animals receiving plasma, spleen homogenate, or spleen filtrate from either normal or immunized animals.

Dissmann, E. & Zechner, E. (1960). Zur Frage der Differenzierung humaner und boviner Tuberkelbakterien mit Hilfe von Thiophen-2-carbonsäurehydrazid (TCH) nach Boenick. [Differentiation of human-type and bovine-type tubercle bacilli by thiophene-2-carbonic acid hydrazide.] — *Z. Hyg. InfektKr.* 146, 210-214. **2781**

The practical value of a method described by R. Boenick in 1958 (*Naturwissenschaften* 45, 392), for distinguishing human-type from bovine-type bacilli with the aid of a culture medium containing thiophene-2-carbonic acid hydrazide, was very limited. Differentiation was possible only after repeated subculture.

—E.G.

Ippen, R. (1960). Die Tuberkulose des Sumpfbibers (*Myocastor coypus*) als diagnostisches Hilfsmittel zur Typendifferenzierung. [Use of the coypu in typing tubercle bacilli.] — *Zbl. Bakt. I. (Orig.)* 178, 195-202. [Summaries in English, French, Spanish and Russian.] **2782**

Nutria were highly susceptible to tubercle bacilli of the human type, showing symptoms 14 days after i/p infection and dying in 21-24 days from generalized TB. Numerous foci were seen in a nutria killed only 12 days after i/p infection, but not in one killed 12 days after s/c infection. Only a few foci were found in 3 of 5 nutria killed 91 or 120 days after i/p infection with tubercle bacilli of the bovine type, and 2 nutria killed 141 days after i/p infection with avian type bacilli had no lesions and did not yield the organism.

—M.G.G.

Konno, K., Nagayama, H. & Oka, S. (1960). Differentiation of bovine tubercle bacilli from other mycobacteria by the determination of nicotinamidase activity.—*Amer. Rev. resp. Dis.* 81, 550-554. [Authors' summary modified.] **2783**

The nicotinamidase activity of cell-free extracts from various mycobacteria was determined qualitatively and quantitatively.

Only bovine tubercle bacilli, irrespective of virulence and isoniazid susceptibility, reveal significantly lower nicotinamidase activity than other mycobacteria. The nicotinamidase activity of human, avian, and unclassified mycobacteria is more than thirty times that of bovine bacilli, while that of non-pathogenic acid-fast bacilli is sixty times greater.

Feldman, W. H. (1960). **Avian tubercle bacilli and other mycobacteria. Their significance in the eradication of bovine tuberculosis.** — Amer. Rev. respir. Dis. 81, 666-673. [Summaries in French and Spanish. Author's summary modified.] **2784**

The importance of the tuberculin test for eradication of bovine TB. is reiterated. Some shortcomings of the procedure are recounted, particularly those concerned with the qualitative aspect of the antigen. Natural infections of cattle and other mammals with the organism of avian TB. are considered, as is the ability of other types of tubercle bacilli to infect heterologous hosts. The question of reciprocal or cross reactions of tuberculin is also emphasized. Attention is drawn to the possibility that certain unclassified mycobacteria may also induce hypersensitivity to tuberculin. It is concluded that eradication of tuberculosis, whether in man or in animals, can be achieved only after the detection of all infected individuals. The recognition generally that hypersensitivity to tuberculin may be induced by, or be associated with, mycobacterial infections other than the classified forms of the genus *Mycobacterium* would contribute much to a more comprehensive and definitive understanding needed to achieve the eventual eradication and control of the still unconquered mycobacterial diseases.

Beck, A. (1960). **Skin sensitisation of guinea-pigs with atypical acid-fast bacilli.** — J. Path. Bact. 79, 285-288. [Author's summary modified.] **2785**

Quantitative skin sensitivity tests, with protein fractions of four strains of atypical acid-fast bacilli and of other mycobacteria, in guinea-pigs infected with these bacilli revealed marked cross-reactivity. A quantitative evaluation suggests that atypical acid-fast bacilli form a serological group which can be distinguished from both tubercle bacilli and saprophytic mycobacteria.

Priestley, F. W. (1960). **The effect of phenol on the complement fixation test for Johne's disease.** — Res. vet. Sci. 1, 177-181. [Author's summary modified.] **2786**

Gorrie's observation, that the addition of phenol to some sera from cattle affected with Johne's disease leads to improved fixation of complement, has been confirmed. The phenol acts immediately. Phenol concentrations between 0.1% and 1% are effective. Temperatures much above 55°C. cause some sera to

lose their ability to fix complement and this ability is restored by the addition of phenol.

The improved ability of some sera to fix complement after addition of phenol is retained after freeze-drying.

Kontrimavichus, L. M. (1959). **[Influence of hyaluronidase on the course of *Mycobacterium johnnei* infection in rats.]** — Trud. vsesoyuz. Inst. eksp. Vet. 22, 64-75. [In Russian.] **2787**

Microscopic examination revealed *M. johnnei* in the organs of all 17 rats that died or were killed up to 206 days after i/p injection of *M. johnnei* and hyaluronidase, but not in 8 rats that received *M. johnnei* alone.

—M.G.G.

Awad, F. I. (1960). **Serologic investigation of pseudotuberculosis in sheep. I. Agglutination test.** — Amer. J. vet. Res. 21, 251-253. [Author's summary modified.] **2788**

This study describes the use of the agglutination test as a method for diagnosing caseous lymphadenitis in sheep.

A bacterial suspension of *Corynebacterium ovis*, Strain 58, yielded the most potent agglutination antigen in a 5% salt solution containing 10 to 20% heated normal rabbit serum with the pH adjusted to 6.8.

The test is specific in the diagnosis of caseous lymphadenitis; in the tube test a titre above 1:64 is significant.

Korotich, A. S., Golota, Y. A. & Gushcha, G. I. (1960). **[Mites and ticks as sources of swine erysipelas infection.]** — Veterinariya, Moscow 37, No. 2 pp. 32-34. [In Russian.] **2789**

E. rhusiopathiae was isolated from one of 174 adult *Ixodes ricinus* and from two of over 800 larvae and nymphs of *Dermacentor pictus*. It was also present in *Trombicula zachvatkini* mites that had fed on experimentally infected mice. In wild rodents the organism was isolated from one of 238 grey rats and one of 110 field voles, but in these animals the infection took an acute course and carriers of infection were unlikely. Ticks were regarded as potential sources of infection for pigs.—R.M.

Maas, A. & Möhlmann, H. (1960). **Experimenteller Beitrag zur Infektion des Schweines mit Rotlauf.** **[Experimental intranasal and conjunctival infection of pigs with swine erysipelas.]** — Arch. exp. VetMed. 14, 123-141. **2790**

Erysipelas was induced in 83 of 88 pigs

by the conjunctival route, 31 of 32 by the intranasal route, and 79 of 105 by skin scarification. Clinical reactions were much more severe and mortality was 3 to 4 times higher in pigs infected conjunctivally or intranasally than in those infected through the skin. Serum neutralization titres were twice as high in pigs recovering from conjunctival infection than in those recovering from cutaneous infection.—M.G.G.

Gray, M. L. (1960). A possible link in the relationship between silage feeding and listeriosis. — J. Amer. vet. med. Ass. 136, 205-208. 2791

In Iceland listeriosis in cattle was so often associated with silage feeding that the disease was called "silage sickness." Olson & others have already shown that feeding maize silage to sheep appeared to enhance experimental infection with listeria [V.B. 24, 3428]. Young & Firehammer [V.B. 28, 3105] found that abortion attributed to listeria infection occurred after silage feeding in a herd of cows. The present author fed silage, which had been blamed for abortions in cows, to 10 pregnant and 10 barren mice. The silage apparently caused no illness. *Erysipelothrix monocytogenes* was isolated by secondary culture from the liver of one mouse, and from the foetuses of another. Another 20 mice were given silage and also cultures of *E. monocytogenes* in drinking water.

G. concluded that further evidence was needed to prove that animals acquired infection from silage.—R.M.

Gourlay, R. N. & Barber, L. (1960). A strain of *Pasteurella haemolytica* isolated from goats in Uganda.—J. comp. Path. 70, 211-216. [Authors' conclusions modified.] 2792

Nine isolations were made from pneumonia and septicaemia in goats. A description is given of the P.M. findings and the characteristics of the organism. Very young kids were apparently much more susceptible than older goats.

Sergeev, V. A. (1959). [Role of bacteria in pneumonia of sheep.]—Trud. vsesoyuz. Inst. eksp. Vet. 22, 185-188. [In Russian.] 2793

Pasteurella was isolated from the lungs of 6 sheep with acute bronchopneumonia and 3 of 6 sheep with the chronic disease. G.pigs died after s/c infection and the strains were recovered from them.—M.G.G.

Talbot, J. M. & Sneath, P. N. A. (1960). A taxonomic study of *Pasteurella septica*,

especially of strains isolated from human sources.—J. gen. Microbiol. 22, 303-311. [Authors' summary modified.] 2794

The characteristics of 59 strains of *Past. septica*, mostly from human lesions, were analysed by an electronic computer. The cat strains showed a high degree of similarity to each other, while the dog strains were more variable. Most human infections other than those due to bites seem to be due to strains which probably originated from cats. The analysis suggests that *Past. septica* is distantly related to *Past. pestis* and *Past. pseudotuberculosis* but that the two last named are closely related to each other.

Nesbitt, P. M. (1960). Infectious bovine keratoconjunctivitis (pinkeye): a new treatment.—Jen-Sal J. 43, No. 1 pp. 2-6. 2795

The drug dequalinium chloride is available under the names "Decton" and "Dequadin chloride." Its use for wound treatment in animals was described in *Vet. Rec.* 69, 387 (1957). Insufflation of powder into the eyes of 85 cattle with "pinkeye" was followed by rapid recovery.—R.M.

Rees, T. A. (1960). The isolation of *Escherichia coli* serotype O.128, B.12 from a case of gastro-enteritis in the calf.—J. Path. Bact. 79, 203-204. 2796

Strains of O.128, B.12 have been isolated from babies. This note records the isolation of a serologically identical strain from a calf suffering from gastro-enteritis.—R.M.

Mackel, D. C., Weaver, R. E., Langley, L. F. & DeCapito, T. M. (1960). Observations on occurrence in cats of *Escherichia coli* pathogenic for man.—Amer. J. Hyg. 71, 176-178. [Authors' summary modified.] 2797

Examination of 103 cats in Arizona yielded 45 isolations (15 types) of recognized or suspected types of *E. coli* pathogenic for man.

Greisman, S. E. (1960). Activation of histamine-releasing factor in normal rat plasma by *E. coli* endotoxin.—Proc. Soc. exp. Biol., N.Y. 103, 628-632. [Author's summary modified.] 2798

Employing isolated g.pig ileum segments in aerated Tyrode solution, 5 to 250 μ g. aliquots of a physiologically active lipopysaccharide component of *E. coli* endotoxin were capable of activating a potent histamine-like releasing factor upon *in vitro* incubation with 0.5 ml. diluted fresh heparinized normal rat plasma. The release of histamine by this

rat plasma factor occurred within seconds after tissue contact. The *E. coli* endotoxin preparation *per se*, in the dose-time relations employed, did not liberate histamine directly from the ileum segments; indeed, 2,000 µg. *E. coli* endotoxin failed to release detectable histamine during 20 min. tissue contact periods. This could not be attributed to pre-existing endotoxin contamination of the tissue bath nor to toxic depression of the histamine sensitivity of the assay system. The above findings, with previous evidence, suggest that *E. coli* lipopolysaccharide behaves, at least in one manner, as do numerous other high molecular weight polysaccharides and justifies the hypothesis that activation of plasma histamine-releasing factors may account for certain of the pathophysiological alterations which characterize the response to endotoxin. Further studies are required to define the importance of the polysaccharide moiety of the endotoxin molecule for the histamine-releasing activity.

Neter, E., Anzai, H., Gorzynski, E. A., Nowotny, A. & Westphal, O. (1960). Effects of lipoid A component of *Escherichia coli* endotoxin on dermal reactivity of rabbits to epinephrine. — Proc. Soc. exp. Biol., N.Y. 103, 783-786. [Authors' summary.] 2799

The purified and polysaccharide-free lipoid A component of *E. coli* O111:B4 endotoxin, upon intravenous injection into rabbits, strikingly alters dermal reactivity to epinephrine. Grossly, the lesions thus produced are red or brownish in appearance or show marked hemorrhages. Lipoid A is active in amounts as small as 2 µg/kg. The original lipopolysaccharide is approximately 10 times more potent than the lipoid A fraction obtained therefrom. Phenoxybenzamine hydrochloride inhibits the epinephrine reaction in rabbits injected with lipoid A.

Muschel, L. H. (1960). Bacterial activity of normal serum against bacterial cultures. II. Activity against *Escherichia coli* strains. — Proc. Soc. exp. Biol., N.Y. 103, 632-636. [Author's summary modified.] 2800

Resistance of *E. coli* from normal children and from those with diarrhoea to bactericidal action of normal human serum was determined. Virulent and non-virulent strains could not be differentiated by serum resistance. Serum resistance was associated with the O-inagglutinability of the organisms.

In addition, bactericidal action of normal human serum against *E. coli* was shown to be dependent upon natural specific antibodies.

Glantz, P. J. (1960). Serological classification of *Escherichia coli*. — Cornell Vet. 50, 9-14. 2801

At present 139 O antigens, 84 K antigens and 60 H antigens have been recognized amongst the *E. coli* group of bacteria. Various identical *E. coli* serotypes have been isolated from cases of calf scour, lamb dysentery, oedema disease of swine, mastitis in cows and chronic respiratory disease in poultry and are probably the pathogenic agents. All members of the genus *Escherichia* can no longer be considered as normal inhabitants of the intestinal tract. Additional serotyping laboratories are badly needed for accurate epidemiological investigation of *E. coli* isolated from animal diseases.—A. ACKROYD.

Smith, H. Williams. (1960). The sensitivity to chemotherapeutic agents of *Salmonellae* isolated from pigs. — Res. vet. Sci. 1, 182-183. [Author's summary modified.] 2802

All except one of 106 strains of salmonella from pigs were sensitive to oxytetracycline, streptomycin, neomycin, chloramphenicol and furazolidone; the exceptional strain was partly resistant to furazolidone. Twenty of these strains were also tested against polymyxin B and nitrofurazone. They were all sensitive to polymyxin B, but one of them, the partly furazolidone-resistant strain, was also resistant to nitrofurazone.

Jungerman, P. F. & Grumbles, L. C. (1960). *Salmonella* organisms in mature, healthy dogs. — Sthwest. Vet. 13, 208-210. [Authors' summary modified.] 2803

Salmonella was isolated from 9 of 100 healthy adult dogs. The salmonella carrier state in dogs is apparently transient. None of the previously infected dogs yielded salmonella when tested after six weeks or longer.

Urea agar was a useful screening medium. After 24 hours' incubation, 89% of the suspected salmonella cultures showed urease activity. These were all subsequently proved to be enteric organisms other than salmonella and all could have been discarded without altering the number of *Salmonella* isolations.

Berry, L. J. & Beuzeville, C. (1960). The effect of delayed injections of tricarboxylic acid cycle inhibitors and reticuloendothelial

"blocking" agents on *Salmonella typhimurium* infection in mice.—J. infect. Dis. 106, 183-192. 2804

Sublethal i/p injections of fluoroacetate or malonate or i/v injections of saccharated iron oxide or "Thorotrast" given to mice immediately after infection with *S. typhimurium* resulted in the death of all the animals before any infected controls died. Injections given 24 hours after, in the case of fluoroacetate only, and 24 hours before infection, in the case of Thorotrast only, also reduced survival time. The effects of fluoroacetate were not related to its ability to poison selected tissues of mice as judged by their citric acid accumulation, nor could the infection-promoting effect be attributed to the carbon compounds most likely to be accumulated in the poisoned animals. Thorotrast retention was significantly less in the liver, only when given concurrently with infection. No differences were observed in the total number of pathogens in the liver or carcass of control and poisoned animals at death, only differences in the rate of multiplication.

—A. ACKROYD.

Clemmer, D. I., Hickey, J. L. S., Bridges, J. F., Schliessmann, D. J. & Shaffer, M. F. (1960). Bacteriological studies of experimental air-borne salmonellosis in chicks.—J. infect. Dis. 106, 197-210. 2805

Chicks (1-2 days old) were exposed to quantitated aerosols of salmonella and the subsequent infection followed by bacterial cultures from birds killed at intervals and compared with the course after oral administration. The number of retained inhaled organisms necessary to initiate respiratory infection was low—in some cases less than 20. The inhaled organisms multiplied freely in the lungs for 3-6 days but usually the pulmonary infection was self-limited in 2-3 weeks. Concurrent enteric and haematogenous infection often resulted. Conversely enteric infection from oral administration frequently resulted in haematogenous spread of organisms to the lungs as well as to other tissues. Mortality following aerosol exposure for most salmonella strains except 2 of *S. pullorum* was no higher than would be expected from oral administration.—A. ACKROYD.

Cameron, J. A., Holtman, D. F. & Jeffries, C. D. (1960). The association of virulence with endotoxin in *Salmonella pullorum*.—J. infect. Dis. 106, 159-161. [Authors' summary modified.] 2806

The virulence of seven strains of *S. pullorum* was determined and compared with the respective toxicity of their endotoxins. The avirulent strain NEC 17 produced an endotoxin of similar potency to that of the virulent strain CDC 3522/51, but NEC 17 produced less endotoxin on a dry cell weight basis.

A comparison of strains of *S. pullorum* of intermediate virulence indicated that the differences in virulence were due to differences in the endotoxin rather than to a reduced amount of endotoxin.

Barber, L. (1959). Laboratory trials on the control of fowl typhoid by vaccination with some observations on the effect of diet.—Bull. epiz. Dis. Afr. 7, 379-388. [Summary in French. Author's summary modified.] 2807

A comparison is made of the immunity produced by four vaccines against Groups B and D *Salmonella*. These were two containing killed *S. gallinarum* organisms produced commercially in Africa; standard T.A.B. vaccine; and the live 9R strain of *S. gallinarum* of Smith. The 9R vaccine, while not preventing the disease, suppressed the mortality, whereas the two killed vaccines and T.A.B. were of little value. The T.A.B. did appear to be of some value in the control of *S. typhi-murium* infections in chickens, but the challenge strain was of low pathogenicity and no definite conclusions could be drawn.

The agglutinating and immunizing antigens may be separate and distinct in *Salmonella*.

By feeding mash containing a low level of terramycin, the death-rate in birds challenged with a local strain of *S. gallinarum* was reduced considerably.

Pulst, H. (1960). Ein Beitrag zur Salmonellose beim Wassergeflügel. [Incidence of salmonella in faeces of ducks and geese].—Mh. VetMed. 15, 226-230. 2808

Excretors of *S. typhi-murium* were found in 44 of 76 flocks of ducks and in 14 of 29 flocks of geese, the incidence ranging from below 1% to over 5%. Of 3 geese given *S. typhi-murium* by mouth 2 excreted the organism until the 18th or 26th day after infection and one became a chronic excretor. The faeces of 2 geese infected i/m remained negative. All 5 developed agglutination titres which disappeared by the 28th day.—M.G.G.

Anon. (1960). *Salmonellae in imported meat*.—Lancet, February 27th, 478-479. 2809

A recent paper [see *V.B.* 30, 1359]

reported a high incidence of salmonella in meat imported into Gt. Britain. Some of the species in boned beef have never been found in living cattle. The problem merits attention by the authorities. Sterilization by gamma irradiation is a possible remedy.—M.G.G.

Dixon, J. M. S. & Wilson, F. N. (1960). *Salmonellae in fertilizers containing superphosphate*.—Mon. Bull. Minist. Hlth Lab. Serv. 19, 79-82. [Authors' summary modified.]

2810

Salmonella organisms were isolated from mixtures containing infected bone-meal and superphosphate that had been prepared to formulae corresponding to those of proprietary fertilizers. A neutral phosphate buffer was used for extraction to bring the pH of the mixtures to 7.0. Without this neutralization culture was unsuccessful.

The frequency of isolation from mixtures containing bone-meal and superphosphate was greatly reduced after storage; the organisms were very difficult to detect after dry storage for 6 months.

There is no reason to believe that compound fertilizers are of importance in the epidemiology of salmonellosis of animals.

Orlov, E. S. (1960). [Incidence of brucellosis in cattle and sheep in the U.S.S.R.]—J. Microbiol., Moscow 31, No. 2 pp. 143-144. [In Russian.]

2811

The author did not give absolute figures, but showed that the number of fresh reported outbreaks in cattle in 1958 was 5.5% of the number reported in 1949, while in sheep the number of fresh outbreaks in 1958 was 13% of that in 1949.

It was estimated that in 1957 the total number of infected herds was 48% of that in 1951.—R.M.

Bouvier, G. (1960). Sensibilité de *Brucella abortus* au pH et à certaines solutions faiblement bactéricides. Nouvelle technique d'isolation des *Brucella* dans du matériel fortement souillé (arrière-faix de bovins). [Influence of pH on *Br. abortus* and its isolation from bovine placenta treated with slaked lime.]—Zbl. Bakt. I. (Orig.) 178, 202-210. [In French. Summaries in English, German, Spanish and Russian.]

2812

Fragments of cotyledon containing *Br. abortus* and contaminated with saprophytes were shaken for 15 min. in 0.1%, 0.2% or 0.5% soln. of slaked lime and centrifuged for 15 min. The sediment was washed 3 times in physiological saline, and incubated in W

medium under CO₂. *Br. abortus* was isolated from 49 of 50 placentas by this method, but from only 16 when the treatment prior to culture was omitted. The organism was also isolated by shaking infected tissue in 1%, 2% or 4% superphosphate for 15-60 min. before culture in W medium. In tests of pH tolerance *Br. abortus* (strain W 99) survived exposure to pH 1.5 for 15 min., to pH 2.5 for 30-60 min., and to 0.5% slaked lime for up to 4 hours.—M.G.G.

Korotich, A. S., Kucherova, N. T., Mol'chenko, E. F. & Netrebko, I. D. (1960). [Nutrient media for more rapid growth of brucella and for distinguishing brucella from other bacteria.]—J. Microbiol., Moscow 31, No. 3 pp. 66-70. [In Russian. Summary in English.]

2813

Bovine amniotic fluid, passed through a Seitz filter and sterilized, gave colonies of brucella within 4 days compared with 9 days for liver broth. Brucella cultures could be recognized among contaminating bacteria by the colour of colonies after 20-24 hours' incubation on liver agar containing 1% glucose, 2% glycerin also saffranin and malachite green each at 1:250,000. Characteristic staining of brucella colonies could also be obtained by running a mixture of 1:5,000 malachite green and 1:2,500 saffranin onto the surface of liver-agar cultures.—R.M.

Lamikhov, K. F. (1959). [Immunization of animals against brucellosis by intranasal administration of Strain 19.] In "Brutsellez sel'sk. zhivotnykh i chuma svinei" pp. 74-81. [Moscow: Izd. Minist. Sel'sk. Khoz. SSSR.] [In Russian.]

2814

The main advantages claimed for intranasal administration were simplicity and avoidance of upsetting the animals. The precise technique was not described, but cattle were given the same dose as that used for s/c inj. Resistance to challenge was tested in g.pigs between 10 and 60 days after immunization and in calves after 1-10 months. The method was also tried on 118 cattle in an infected herd. Distribution of the Strain 19 in organs, serological reactions, and the number of abortions in immunized animals were similar to controls which received Strain 19 subcutaneously.—R.M.

Zamakhaeva, E. J. & Abakin, S. V. (1959). [Immunization of sheep with *Brucella abortus* Strain M.] In "Brutsellez sel'sk. zhivotnykh i chuma svinei" pp. 132-142. [Moscow: Izd.

Minist. Sel'sk. Khoz. SSSR.] [In Russian.] **2815**

Strain M vaccine was obtained from the Gameliya Institute of Epidemiology and Microbiology in Moscow. Preliminary experiments on 42 sheep showed that inoculation of 8,000 million organisms s/c gave better protection against 5-10 million organisms of *Br. melitensis* Strain 548 at 1·5 and 7·5 months after inoculation than Strain 19. The authors planned to inoculate 13,000 sheep in the Caucasus with Strain M.—R.M.

McGowan, B. & Devine, D. R. (1960). **Epididymitis of rams. The effect of the naturally occurring disease upon fertility.**—Cornell Vet. 50, 102-106. **2816**

Of 29 rams with brucella epididymitis 22 yielded semen of poor quality, as judged by percentage of live spermatozoa, motility, number of spermatozoa, and morphology. Six of the rams were each run with ten ewes. In 4 rams the quality of the semen corresponded with the percentage of ewes lambing, but the fertility of 2 was higher than expected, one being of apparently normal fertility.—M.G.G.

Renoux, G. (1960). Brucellose spontanée du rat, *Rattus norvegicus*. [Spontaneous Brucella melitensis infection in rats.]—Arch. Inst. Pasteur Tunis 37, 113-115. **2817**

Br. melitensis was isolated from 2 of 12 *Rattus norvegicus* captured in the vicinity of infected goats at the time of parturition, but not from 41 rats and 11 mice caught in buildings containing infected sheep and goats that were not pregnant.—M.G.G.

Spink, W. W. & Bradley, G. M. (1960). **Persistent parasitism in experimental brucellosis: attempts to eliminate brucellae with long-term tetracycline therapy.**—J. Lab. clin. Med. 55, 535-547. **2818**

Counts of *Br. melitensis* colonies in the spleen of mice given 50,000 organisms i/p revealed multiplication for up to 8 weeks and an abrupt decrease between 12 and 16 weeks after infection. After 40 weeks brucella was recovered from the spleen of 3 of 9 mice. Daily administration of 60 mg./kg. of tetracycline in the food, beginning 4 weeks after infection, suppressed the multiplication of the brucella, but the number of mice with persistent infection was the same as that in untreated controls if treatment lasted for only 4 weeks. When treatment was given for 3 or 6 months or for the second and sixth months after infection, brucella was recovered from

the spleen of 3 of 20 mice 40 weeks after infection. Treatment did not alter the pattern of agglutination titres. Treated mice had fewer granulomas in the liver than untreated mice. Of 10 mice given tetracycline for 4 weeks, beginning on the day before they were infected, 4 yielded brucella 12 weeks after infection.—M.G.G.

Drankin, D. I., Zamotin, B. A. & Korzheva, V. S. (1960). [Epidemiology of *Brucella suis* infection.]—J. Microbiol., Moscow 31, No. 2 pp. 95-100. [In Russian. Summary in English.] **2819**

Sera from 444 persons on a farm where brucellosis had been diagnosed in pigs were examined by 3 tests. 80 (19%) reacted positively to the tests. Only 9 had had any illness and 3 of the 9 had been treated for brucellosis. Of 61 persons in direct contact with pigs, 19 gave positive tests and 3 had clinical brucellosis. This compared favourably with the proportion of persons in direct contact with infected sheep that developed clinical brucellosis—often 1 in 3.—R.M.

Renoux, G. (1960). Nouvelles épreuves bactériostatiques pour différencier les Brucella. Résultats et conséquences. [New bacteriostatic tests for differentiating brucella strains.]—Arch. Inst. Pasteur Tunis 37, 23-35. **2820**

1,086 smooth strains of brucella were divided into 4 groups according to their ability to grow in the presence of Janus green (1: 80,000) or erythromycin (15 µg./ml.). The results of this method of classification did not coincide with those of the accepted method which uses thionine and basic fuchsin. It was argued that both methods are arbitrary and that these results throw doubt on the present classification of brucella.—M.G.G.

Musaev, M. A. (1960). [Environmental factors influencing the incidence of bovine leptospirosis.]—Veterinariya, Moscow 37, No. 1 pp. 22-25. [In Russian.] **2821**

Seven years' observation in Azerbaijan showed that the number of infected premises having acid soil was one-sixth of the number of infected premises with neutral or alkaline soil.—R.M.

Bokori, J., Kemenes, F., Szemerédi, G. & Székely, A. (1960). Ovine leptospirosis caused by *Leptospira pomona* in Hungary.—Acta vet. Acad. Sci. hung. 10, 101-109. [In English.] **2822**

An English version of work previously published in Hungarian [V.B. 29, 2750].

—R.M.

Smith, R. E., Reynolds, I. M. & Sakai, T. (1960). **Experimental leptospirosis in pregnant ewes. III. Pathological features.** —

Cornell Vet. 50, 115-122. [Authors' summary modified.]

2823

Four groups of pregnant ewes were experimentally infected with *Leptospira pomona*.

Of the 20 inoculated, 3 developed severe haemolytic anaemia; one died and two were killed when moribund. Gross lesions included icterus, haemoglobinuria, and renal haemorrhages. Lesions of leptospirosis were largely absent in the remaining sheep, although in all except two there was bacteriological or serological evidence of infection.

Silver-stained sections of liver from 2 ewes killed 3 days after inoculation revealed leptospires. These sheep were 2 of 3 from which leptospires had been recovered from the placenta. No leptospires were seen in tissues of other sheep.

No gross or microscopic changes were noted in the 16 foetuses examined, neither were leptospires demonstrable in silver-stained sections.

Vysotskii, B. V., Malykh, F. S. & Prokof'ev, A. A. (1960). [Leptospirosis in cats.] —J. Microbiol., Moscow 31, No. 2 pp. 140-141. [In Russian.]

2824

Discussing the literature, the authors cited the work of N. I. Amosenkova (published as a thesis in 1955) who examined 358 cats in Leningrad for agglutinins to *L. canicola* and *icterohaemorrhagiae* and found only one reaction at 1:500 to the latter antigen.

The present authors examined 30 cats in Vladivostok using up to 11 antigens. One serum gave a *L. grippo-typosa* titre of 1:1000 and another gave a *L. canicola* titre of 1:6400. *L. grippo-typosa* was isolated from the kidneys of a wild cat that gave a titre of 1:100 to this serotype.—R.M.

Morse, E. V. (1960). **New concepts of leptospirosis in animals.** —J. Amer. vet. med. Ass. 136, 241-246.

2825

L. pomona infection in the U.S.A. was reviewed briefly; 98% of the endemic infections in cattle and pigs are due to this serotype. Factors that perpetuate infection are prolonged excretion of large numbers of leptospires by infected pigs and cattle; a

temperature climate; wildlife reservoirs; and certain management practices such as crowding of animals at feeding and watering places. Further investigations are needed into the part played by wild animals; the differences in virulence between strains; the apparently greater susceptibility of beef cattle compared with dairy cattle; and the problem of serological cross-reactions against other serotypes.

—M.G.G.

Pleško, I., Bakoss, P., Kmety, E. & Vachold, J. (1960). Nosičstvo leptospír u ježov na Slovensku. [Hedgehogs as carriers of leptospira in Slovakia.] —Čsl. Epidemiol. Mikrobiol. Immunol. 9, 12-15. [In Slovak. Summaries in English and Russian.]

2826

Of 96 hedgehogs 34 gave positive agglutination-lysis reactions with *Leptospira bratislava*, a serotype antigenically related to *L. australis*. Antibodies against *L. sejroe* were demonstrated in eight, and against *L. pomona*, *L. sorex-jalna* (*L. javanica* group) and *L. icterohaemorrhagiae* in two hedgehogs each. Fourteen strains of *L. bratislava* and one each of *L. sejroe*, *L. pomona* and *L. sorex-jalna* were isolated.—E.G.

Bürki, F. (1960). Zum Nachweis von Leptospiren mittels des Goldhamster-Tierversuchs. [Use of hamsters in the diagnosis of leptospirosis.] —Zbl. Bakt. I. (Orig.) 178, 211-222. [Summaries in English, French, Spanish and Russian.]

2827

Each of 7 strains of leptospira was injected i/p into 4 hamsters. Cultures in Korthof's medium of heart blood taken on the 2nd and 4th days were positive for 8 hamsters infected with *L. pomona*, *canicola*, *icterohaemorrhagiae* or *hyos*, but negative for 2 infected with *L. sejroe* and 2 of 4 infected with *L. grippo-typosa* or *sejroe* K. On the 21st day positive blood agglutination titres were found in all surviving pairs of hamsters excepted those infected with *L. sejroe* K, but cultures of kidney were negative. In experiments with diluted suspensions of a recently isolated strain of *L. pomona* the hamster test was more sensitive than Korthof's medium. The hamster test is recommended for the demonstration of leptospira in contaminated samples. Cultures of heart blood should be made between 5 and 10 days after infection and serological tests after 21 days.—M.G.G.

Polykovskii, M. D., Kagan, F. I. & Podkopaev, V. M. (1960). [Activation of epsilon toxin in cultures of *Clostridium welchii* Type

D.]—Veterinariya, Moscow 37, No. 2 pp. 44-46. [In Russian.] 2828

Trypsin was added to centrifuged fluid (pH 7.2-7.8) from 5-6 hour cultures of the organism at the rate of 0.25 g. to 100 ml. The mixture was incubated for an hour then its toxicity was tested on mice. It was claimed that trypsinized fluid was 200-300 times more toxic than untreated fluid. The method could be used to improve bacteriological diagnosis of enterotoxaemia in sheep, and for the preparation of toxoid.—R.M.

Penso, G. & Vicari, G. (1959). Studio dei fenomeni immunitari per mezzo delle colture di tessuto. IV. Sull'azione citopatogena della tossina di *Clostridium histolyticum*. V. Sull'azione citopatogena della tossina di *Clostridium septicum*. VI. Sull'azione citopatogena della tossina di *Clostridium oedematiens*. [Study of immunological phenomena by means of tissue culture. IV. Cytopathogenicity of *Clostridium histolyticum* toxin. V. Cytopathogenicity of *Clostridium septicum* toxin. VI. Cytopathogenicity of *Clostridium oedematiens* toxin.]—R.C. Ist. sup. Sanit. 22, 131-134; 135-137 & 138-140. [Summaries in English, French and German.] 2829

The cytopathic effects of clostridial toxins were studied on human liver and kidney, and monkey kidney and buccal carcinoma cells. With *Cl. histolyticum* toxin, changes occurred after about 2 hours' incubation and consisted of: vacuolar degeneration of protoplasm (not due to steatosis), followed by cellular degeneration, nuclear pyknosis, and death and detachment of the cells. With *Cl. septicum* toxin they occurred after just over 1 hour's incubation, and consisted of hyperchromia of the nuclei followed by alteration of the cytoplasm, which lost its homogeneous aspect and its outline and rapidly disintegrated; death and detachment of the cells occurred after 6 hours. With *Cl. oedematiens* toxin they occurred after 4 hours' incubation and were characterized by nuclear pyknosis, contraction of the cytoplasm (these phenomena developed and were complete in 24 hours); the cells assumed the shape of cytoplasmic rings round hyperchromic nuclei and died without becoming detached from the wall of the culture tube.

—T.E.G.R.

Chodnik, K. S., Jull, D. J. & Addison, I. A. (1960). The transmission of immunity to tetanus from ewe to lamb.—Vet. Rec. 72, 277-280. [Authors' summary modified.] 2830

Ewes immunized against tetanus transmit

to their lambs specific antibodies *via colostrum* in amounts assuring their full protection against infection in early life. Amounts of antibodies transferred depend on the mother's titre at the time of parturition, and the duration of acquired immunity depends on the amount of antibodies received from the mother. Feeding on the first colostrum plays a vital part in antibody transfer.

Lamanna, C. & Meyers, C. E. (1960). Influence of ingested foods on the oral toxicity in mice of crystalline botulinic type A toxin.—J. Bact. 79, 406-410. [Authors' summary modified.] 2831

The potency of orally administered crystalline type A botulinus toxin is influenced by ingested foods. Mouse pellet feed, egg albumen and olive oil increase toxic potency, and skim milk powder decreases it. Quantitative statements of oral toxicity should include information on the food consumption by test animals.

Wright, G. G., Duff, J. T., Fiock, M. A., Devlin, H. B. & Soderstrom, R. L. (1960). Studies on immunity to toxins of *Clostridium botulinum*. V. Detoxification of purified Type A and Type B toxins, and the antigenicity of univalent and bivalent aluminium phosphate adsorbed toxoids.—J. Immunol. 84, 384-389. [Authors' summary modified.] 2832

Procedures were developed for preparation of purified adsorbed toxoids. Purified toxins were converted to toxoids at pH 5.5 and 35°C., in the presence of 0.6% formalin. Preparations of type A toxin were usually detoxified for g.pigs in 16 days; type B toxin required 20 days. Although the toxins were initially more toxic for mice than for g.pigs, detoxification for mice occurred more rapidly than detoxification for g.pigs. Toxoids were readily adsorbed on aluminium phosphate suspension, and bivalent adsorbed preparations were antigenic in mice, g.pigs and rabbits. The adsorbed toxoids deteriorated slowly when held at 4°C., but retained appreciable antigenicity after 3 years.

Ploskirev, N. V., Komkova, O. A., Grebenkina, V. F. & Ivanova, L. G. (1960). [Dried nutrient media for clostridia.]—J. Microbiol., Moscow 31, No. 3 pp. 40-44. [In Russian. Summary in English.] 2833

Waste fish products were tested. A satisfactory powder was made from 20 g. sprat autolysate, 25 g. peptone, 1 g. agar, 4 g. gelatin, 5 g.

glucose, 10 g. sodium chloride. Medium was prepared by adding 5 g. of powder to 100 ml. of water.—R.M.

Power, J. H. (1959). **A study in genital vibriosis in the bovine.**—Irish vet. J. 13, 142-159 & 162-168. 2834

After outlining the history and manifestations of genital vibriosis in cattle, the results of an investigation, started in 1954, into genital vibriosis in Ireland are summarized. Three cases of *V. fetus* infection were identified in bulls on the breeding record combined with cultural, biochemical and serological methods. *V. fetus* was recovered in each case from semen by the intravaginal inoculation of in-oestrus g.pigs and culture of their uteri, in one case from cervico-vaginal mucus by Adler's method and in another from the stomach contents of an aborted foetus. Specific agglutinins were demonstrated in the cervico-vaginal mucus of some of the females served. Treatment of males and females by penicillin and dihydrostreptomycin was satisfactory as shown by the subsequent breeding records. In 6 naturally infected maiden heifers, specific agglutinins were demonstrable in both serum and vaginal mucus 40-51 days after service. The titre in the serum fell rapidly and soon disappeared, but in the vaginal mucus, the decline was gradual and high titre persisted longer. Transitory serum agglutinins could be stimulated by the deposition of formalized *V. fetus* antigen in the uterus of maiden heifers. They did not invariably appear in the vaginal mucus, but, when they did, the reaction was present for a relatively short period following a lengthy induction phase. G.pigs and rabbits could be infected intravaginally and g.pigs and hamsters intraperitoneally. Five techniques are outlined for the diagnosis of *V. fetus* infections in carrier bulls.—A. ACKROYD.

Moore, A. B. & Ensor, C. R. (1960). **What was attempted in the Purua foot rot scheme and what was achieved.**—N.Z. J. Agric. 100, 245, 247 & 249. 2835

In 1955, in a trial of the effectiveness of the Beveridge method for the control of foot rot in sheep at Purua, North Auckland, a region of persistent wet conditions, all infected sheep had their feet pared and entered a 10% formalin foot-bath every 2-3 weeks until cured. In the first year in the 25,000 sheep on the 26 farms participating, the incidence fell from 50% to 5% and has remained at this ever since. Six flocks were completely

cleared of foot rot in the first season and one later, but 2 subsequently became re-infected. Although foot rot can be cured in the individual sheep by these methods, unless a treatment using some medicament with considerable penetrating power is obtained to overcome the deficiencies in detection, a new approach will have to be considered. More intensive experimental work is now being undertaken on 6 farms.—A. ACKROYD.

Vallée, A., Durieux, J., Durieux, M. & Virat, B. (1960). **Etude d'une pyodermité particulièrement rebelle chez le chien: isolement d'Actinobacillus equuli associé à un staphylocoque.** [Isolation of *Bact. viscosum equi* and *staphylococci* from persistent suppurative dermatitis in a dog.]—Bull. Acad. vét. Fr. 33, 153-156. 2836

Suppuration of interdigital spaces and lower lip resisted a year's treatment with a variety of antibiotics, sulphonamides and staphylococcal toxoid. After bacteriological diagnosis, treatment with chloramphenicol by mouth, crystal violet applied to the lesions and an autogenous vaccine led to recovery.—R.M.

Saltykov, R. A. & Zemskov, E. M. (1960). **[Combined immunization with live and chemically inactivated vaccines. I. Mixture of adsorbed clostridial toxoid and live plague or tularaemia vaccine.]**—J. Microbiol. Moscow 31, No. 4 pp. 60-64. [In Russian. Summary in English.] 2837

A pentavalent toxoid against *Clostridium tetani*, *botulinum A & B*, *welchii* and *oedematum* (adsorbed on aluminium hydroxide, formalized and vacuum-dried) was combined with live plague vaccine or live tularaemia vaccine. The freshly-prepared mixture was inj. s/c into rabbits and g.pigs. Combination did not affect the potency of toxoid or vaccine.—R.M.

Shaburov, M. S. (1959). **[Illness in horses caused by feeding oats contaminated with smut fungus.]**—Trud. vsesoyuz. Inst. eksp. Vet. 22, 281-285. [In Russian.] 2838

Paraplegia developed in 12 strenuously worked horses fed for a month or more on an inadequate ration containing oats contaminated with smut fungus. Eleven died. P.M. there were haemorrhages in the lymph nodes and viscera, degeneration of the viscera, and necrotic foci in the mucosa and submucosa of the small and large intestines. Similar symptoms and P.M. changes were seen in 2 horses that were fed the contaminated oats experimentally and died in the 6th week.

—M.G.G.

Winner, H. I. (1960). **Experimental moniliasis in the guinea-pig.**—J. Path. Bact. 79, 420-423. [Author's summary modified.] 2839

The injection of living *Candida albicans* into the skin or peritoneal cavity of g.pigs produced self-limited disease both in cortisone-treated and untreated animals. Intravenous injection produced a generalized infection which was fatal if the dose of organisms was large. The yeast proliferated in the tissues exciting little or no cellular reaction, and no enlargement of the spleen or lymph nodes, but producing some cellular damage, possibly by toxic action. Death seemed to be due to acute pulmonary congestion and oedema.

Frágner, P. (1960). Příspěvek k epidemiologii trichofycí v zemědělství v pražském kraji. [Epidemiology of Trichophyton infection in agricultural labourers and livestock in the Prague district.]—Čsl. Epidem. Mikrobiol. Imunol. 9, 47-51. [In Czech. Summaries in English and Russian.] 2840

During 1954-58, in the Prague district, *Trichophyton* infection was diagnosed in 204 agricultural labourers and 1,360 cattle. From human patients *T. gypseum* var. *asteroides* was isolated 16 times and *T. schoenleinii* var. *album* 26 times. Control measures in man and animals were discussed.—E.G.

Awad, F. I. (1960). **Nocardiosis of the bovine udder and testis.**—Vet. Rec. 72, 341-342. [Author's summary modified.] 2841

In all cases investigated the aerobic acid-fast *N. farcinica* was demonstrated by culture and g.pig inoculation.

The histopathological similarity to TB. was pointed out.

The economic importance of udder and testis infection has also been shown.

Phillips, J. E. (1960). **The characterisation of *Actinobacillus lignieresi*.**—J. Path. Bact. 79, 331-336. 2842

The paper describes the morphological, cultural and biochemical characters of 225 strains of *A. lignieresi* isolated from lesions in cattle and sheep.—R.M.

Provost, A., Villemot, J. M., Queval, R. & Valanza, J. (1959). Les limites d'interprétation de la réaction d'agglutination sur lame dans le diagnostic de la périplemonie. [The slide agglutination test for bovine contagious pleuropneumonia.]—Bull. epiz. Dis. Afr. 7, 337-343. [Summary in English.] 2843

Cattle developed positive reactions to this test after experimental infection with genital

PPLO or the agent of caprine contagious pleuro-pneumonia. It was concluded that negative reactions are reliable, except in the first stage of incubation and the final clinical stage, but positive reactions may be non-specific. Cross-agglutination reactions with cow pox virus, *Pasteurella multocida*, *Escherichia coli* and species of salmonella were not observed.—M.G.G.

I. Villemot, J.-M. & Provost, A. (1959). Recherches immunologiques sur la périplemonie. VI. Bases d'une classification sérologique des micro-organismes du genre Mycoplasma. [Immunological studies on pleuropneumonia. VI. Serological classification of pleuropneumonia-like organisms.]—Rev. Élev. 12, 369-379. [Summaries in English and Spanish.] 2844

II. Provost, A., Villemot, J. M. & Queval, R. (1959). Recherches immunologiques sur la périplemonie. VII. Immunisation au moyen d'une souche avianisée de *Mycoplasma mycoides* var. *mycoides* inoculée par la voie du muse. [Immunological studies on pleuropneumonia. VII. Immunization of cattle by injection of an avianized strain of PPLO into the muzzle.]—Ibid. 381-404. [Summaries in English and Spanish.] 2845

I. Gel precipitation tests and agglutination tests were performed with 12 different antisera and antigens prepared from PPLO strains from man, cattle and goats and also an American strain isolated from turkeys with encephalitis. The results are tabulated.

II. Strain T3 adapted by Piercy & Knight [V.B. 26, 3127] was injected into zebu cattle in 1 ml. doses by means of a hypodermic needle inserted 1.5 cm. into the muzzle. Anatomy of the muzzle and reaction to injection were studied. The vaccine gave good protection in trials in Central Africa.—R.M.

Thomsett, L. R. (1960). **Eperythrozoon felis: observations on incidence and relationship to external parasitism in the cat.**—Vet. Rec. 72, 397-398 & 399. [Author's summary modified.] 2846

In a survey for *Eperythrozoon felis* infection in cats in the London area to determine whether this could be associated with the presence of ectoparasites, *E. felis* was not seen in blood films examined from 126 cats.

A possible source of infection is suggested for the cases seen in the Cambridge area.

Coleman, G. S. (1960). **A sulphate-reducing bacterium from the sheep rumen.**—J. gen.

Microbiol. 22, 423-436. [Author's summary modified.]

2847

A spore-forming, mesophilic, sulphate-reducing bacterium has been isolated from the rumen of hay-fed sheep. The organism is an obligately anaerobic Gram-negative rod which, in the presence of sulphate and 0.1% yeast extract, used only L- or D-alanine, DL-lactate, pyruvate or formate, but not 47 other compounds tested, as hydrogen donor for growth.

Blackburn, T. H. & Hobson, P. N. (1960). I. Proteolysis in the sheep rumen by whole and fractionated rumen contents. II. Isolation of proteolytic bacteria from the sheep rumen. III. Breakdown of protein and proteolytic activity in the sheep rumen at different times after feeding.—J. gen. Microbiol. 22, 272-281, 282-289 & 290-294. [Authors' summaries modified.]

2848

I. The proteolytic activity did not depend on the diet. Optimum pH for proteolysis lies between 6 and 7, with an irregular maximum at about pH 6.5. All fractions of rumen contents (protozoa, large bacteria and small bacteria) show activity. Proteolytic activity can be demonstrated in the supernatant liquid after disruption of the micro-organisms. The

See also absts. 3069 (report, Australia); 3117 (report, India).

DISEASES CAUSED BY PROTOZOAN PARASITES

Smith, I. M. & Brown, K. N. (1960). Chemoprophylaxis against bovine trypanosomiasis. II. Duration of protection afforded by preparations of metamidium, prothidium and antrycide prosalt in an area of high tsetse density.—J. comp. Path. 70, 161-175. [Authors' conclusions.]

2849

An experiment in an area densely infested with tsetse, chiefly *G. pallidipes*, compared the duration of protection against trypanosomiasis conferred on zebu cattle by metamidium salts, Prothidium and quinapyramine (prophylactic).

The approximate average durations of protection produced were: M & B 4427 fine suspension (10 mg./kg.), 21 weeks; metamidium chloride hydrochloride (4 mg./kg.), 18 weeks; M & B 4427 coarse suspension (10 mg./kg.), 17 weeks; Prothidium (4 mg./kg.), 15½ weeks; quinapyramine (prophylactic) (11.7 mg./kg.), 10 weeks.

Slight systemic effects were observed with metamidium chloride hydrochloride immediately after injection. Clinical appear-

proteolytic activity of the whole rumen fluid was enhanced by cysteine at 0.06 and 0.006% (w/v) unless the rumen fluid had been collected and processed under highly anaerobic conditions. Potassium cyanide and ascorbic acid were also slightly stimulative, but sodium thiosulphate, thioglycolic acid, sodium sulphide and Fe, Ca and Mg ions had no effect.

II. Several culture media were used to isolate bacteria from the rumen. Only a small proportion of the bacteria were actively proteolytic, and these belonged to a limited number of types. These bacteria were found in sheep on different diets, but comparison with the proteolytic activity of whole rumen contents suggested that they represented only a fraction of the proteolytic organisms of the rumen.

III. In sheep fed on a diet partially 'defined', the dietary protein was broken down in the rumen very rapidly after feeding. In conformity with this, the proteolytic activity of the rumen micro-organisms was relatively constant and comparatively high even before feeding. The number of proteolytic bacteria which were cultured from the rumen was relatively low at all times, although it increased after feeding.

ances and body weights did not suggest the occurrence of any delayed systemic effects in the cattle. With the preparations of metamidium the local reaction at the site of injection intramuscularly in the neck was worse than that observed with Prothidium and quinapyramine (prophylactic) subcutaneously in the dewlap.

Baker, J. R. (1960). The influence of the number of trypanosomes inoculated on the prepatent period of the subsequent trypanosomiasis in laboratory rodents.—Ann. trop. Med. Parasit. 54, 71-74. [Author's summary modified.]

2850

The prepatent period of infections due to *Trypanosoma brucei* (strain Lugala I) in rats, mice and g.pigs and of those due to *T. rhodesiense* (strain Wellcome) in rats bears an inverse linear relationship to the log. of the number of trypanosomes inoculated.

McTaggart, H. S. (1960). Coccidia from mink in Britain.—J. Parasit. 46, 201-205. [Author's summary modified.]

2851

Two hundred mink from 42 farms were examined P.M. *Eimeria vison* was found in 3 mink from 3 farms, and *Isospora laidlawi* in 5 mink from 3 farms. The oocysts are described in detail and the descriptions are compared with those of earlier authors.

Arundel, J. H. (1960). **Chemotherapy of caecal coccidiosis in chickens.** 3 : 5 dinitro-o-toluamide.—Aust. vet. J. 36, 49-53. 2852

"Zoalene" (3 : 5 dinitro-o-toluamide) was compared with other coccidiostatic drugs in experimental *E. tenella* infections.

Used prophylactically, 0·01% in mash, the drug prevented deaths in infections which killed nearly half the untreated controls. Therapeutically, 0·03% in the mash gave almost complete control at 76 hours after inoculation with oocysts, and mortality was halved at 80 hours. In drinking water 0·012%-0·015% gave maximum benefit.

Therapeutic concentrations at 0·025-0·03% in mash and 0·012% in water would be satisfactory for field use. To prevent delayed deaths "Zoalene" should be used at therapeutic levels for 3-4 days and then at prophylactic level (0·01%) for a week.

—L. HART.

Ball, S. J. (1960). **Associations of various sulphonamides and pyrimethamine in the chemotherapy of caecal coccidiosis.** —J. comp. Path. 70, 249-256. [Author's conclusions modified.] 2853

Mixtures of pyrimethamine and various sulphonamides showed activity against severe experimental *E. tenella* infections in chicks when treatment started one day before infection and continued for 8 days. These mixtures tended to cause only a temporary inhibition in the development of the parasite, and clinical symptoms of caecal coccidiosis often accompanied by deaths occurred after treatment ceased.

By comparison, treatment with 0·05% pyrimethamine plus 0·05% sulphadimidine or 0·0125% sulphaquinoxaline gave complete protection when given from the 3rd to the 7th day after infection.

Guillon, J.-C., Palisse, M. & Toucas, L. (1959). Lésions d'encéphalomalacie et coccidiose aviaire. [Comparison of encephalomalacia in fowls and degenerative lesions of the nervous system associated with coccidiosis.]—Bull. Acad. vét. Fr. 32, 513-525. 2854

Lesions similar to those of nutritional encephalomalacia occurred in 29 fowls heavily

infested with coccidia [type not stated]. These lesions, which are described in detail, were also observed in the meninges, other organs and tissues.—T.E.G.R.

Schwalbach, G. (1960). Die Coccidiose der Singvögel. I. Der Ausscheidungsrythmus der Isospora-Oocysten beim Haussperling (Passer domesticus). [Coccidiosis in passerine birds. I. Isospora infection in sparrows.]—Zbl. Bakt. I. (Orig.) 178, 263-276. [Summaries in English, French, Spanish and Russian.] 2855

Faecal examination revealed *Isospora* infection in all of 191 sparrows. Oocysts were excreted only at a certain period of the day, beginning in the early afternoon or evening and ceasing at about midnight. In 3 sparrows for which day and night were artificially reversed, excretion began during the morning and ceased in the afternoon. These data may explain the differences in the incidence of infection reported in the literature. The relationship between this parasite and its host was discussed.—M.G.G.

Tewari, A. N. & Iyer, P. K. R. (1960). **Globidiosis in goats.** —Indian vet. J. 37, 141-143. [Authors' summary modified.] 2856

Three cases of globidiosis in goats are described in which an oocyst or oocyst-like stage of the parasite was present. The probable bearing of this structure on the life cycle of the parasite is discussed.

Beveridge, G. G. L., Thwaite, J. W. & Shepherd, G. (1960). **A field trial of amicarbalide—a new babesicide.** —Vet. Rec. 72, 383-386. [Authors' summary modified.] 2857

Amicarbalide (3 : 3'-diamidinocarbanilide), a new babesicide effective in the treatment of bovine redwater due to infection with *Babesia divergens*, is described. Evidence suggests that the compound offers advantages over existing treatments.

Details are given of studies to determine local and systemic tolerance and therapeutic activity in natural infections in cattle. Recommendations are made for treatment in endemic areas.

Barnett, S. F. & Brocklesby, D. W. (1959). **Theileria lawrencei in Kenya.** —Bull. epiz. Dis. Afr. 7, 345-347. [Summary in French. Authors' summary modified.] 2858

Theileria lawrencei has been found in two areas of Kenya, one near Nyeri and the other near Rumuruti.

Seneviratna, P. & Kumaraswamy, S. (1960). **The presence of *Gonderia annulata* in the ox in Ceylon.** — Ceylon vet. J. 8, 26-29. [Authors' summary modified.] 2859

This report of *Theileria annulata* from an ox is the first record of this parasite from Ceylon.

Ristic, M. (1960). **Structural characterization of *Anaplasma marginale* in acute and carrier infections.** — J. Amer. vet. med. Ass. 136, 417-425. [Author's summary modified.] 2860

Electron microscopy revealed 3 distinct morphological forms in the development of *A. marginale*: the classical marginal inclusion body (0.3 to 1.0 μ diameter), occupying a marginal position within the erythrocytes; an intermediate size initial body, or subunit of the classical inclusion (300 to 400 $\mu\mu$ diam.); and a smaller form, or polyhedral body, a subunit of the initial body (average 90 to 120 $\mu\mu$ diam.).

Evidence indicated that the initial body persists in the erythrocytes of carrier cattle, thus explaining the infectivity of their blood; and that the initial body could transgress the erythrocytic membrane, and thus participate in completion of an extra- and intraerythrocytic cycle.

Christensen, J. F., Osebold, J. W., Harrold, J. B. & Rosen, M. N. (1960). **Persistence of latent *Anaplasma marginale* infection in deer.** — J. Amer. vet. med. Ass. 136, 426-427. [Authors' summary modified.] 2861

Three Columbian black-tailed deer (*Odocoileus hemionus columbianus*) were carriers of *Anaplasma marginale* approximately 11 months after they were infected with blood from cattle. Three splenectomized calves inoculated with blood from these deer developed severe clinical anaplasmosis, relatively high percentages of erythrocytes containing anaplasma bodies, and marked increases in complement-fixing antibodies.

Ristic, M. & White, F. H. (1960). **Detection of an *Anaplasma marginale* antibody complex formed in vivo.** — Science 131, 987-988. [Authors' summary modified.] 2862

A naturally occurring anaplasma-antibody complex was detected by exposing r.b.c. of infected cattle to fluorescein-labelled bovine antigen-globulin. This technique revealed not only the classical marginal bodies but also the initial *Anaplasma* bodies in the r.b.c. of acutely infected animals. Singly occurring initial bodies were observed in the r.b.c. of healthy carriers.

Havlík, O. & Hübner, J. (1960). **Výskyt toxoplasmózy v chovech králiku v ČSR.** [Toxoplasmosis in rabbits in Czechoslovakia.] — Čsl. Epidem. Mikrobiol. Imunol. 9, 16-22. [In Czech. Summaries in English and Russian.] 2863

Of 110 laboratory rabbits 104 gave positive Sabin-Feldman reactions to toxoplasmosis, the majority having titres of 1:16 or 1:64, although titres ranged from 1:4 to 1:1,000,000. Toxoplasma was isolated from brain and organs of two rabbits which had previously yielded titres of 1:1,024 and 1:260,000, respectively. Pathogenicity for mice, was at first low but increased after several mouse passages. The role of rabbits in human toxoplasmosis was discussed.—E.G.

Coleman, G. S. (1960). **The cultivation of sheep rumen oligotrich protozoa in vitro.** — J. gen. Microbiol. 22, 555-563. [Author's summary modified.] 2864

Oligotrich protozoa from the sheep rumen, principally *Entodinium caudatum*, were maintained in culture and dividing every 2 days at a density of 15,000-30,000 protozoa/ml. for 18 months on a medium of rice starch, dried grass, 10% rumen fluid (fresh or autoclaved) and 50 μg . chloramphenicol/ml.

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Bindrich, H. & Kuwert, E. (1960). **Zur Zytopathogenität des Virus der Maul- und Klauenseuche in Einschichtzellkulturen aus Kälbernieren.** [Comparison of the cytopathic action of 27 strains of foot and mouth disease virus on calf-kidney monolayer cultures.] — Arch. exp. VetMed. 14, 142-150. 2865

Of 26 strains isolated directly from the tongue of infected cattle, 7 were not cyto-

pathic for calf kidney cells, and 19 were cytopathic in different degrees. A strain undergoing passages in tongue epithelium according to Frenkel's method was initially non-pathogenic for calf kidney cells, but after 26 passages in tongue epithelium the ability to destroy kidney cells appeared and became increasingly pronounced. Strains of type A tended to be more cytopathic than those of type O.—M.G.G.

Bocciarelli Steve, D., Castagnoli, B., D'Amore, A., Mazzaracchio, V., Orfei, Z. & Ravaioli, L. (1959). Osservazioni al microscopio elettronico di cellule renali di suino infettate con il virus aftoso. (Nota preliminare.) [Electron microscopy of pig kidney cells infected with foot and mouth disease virus (preliminary note).]—R.C. Ist. sup. Sanit. 22, 747-750. [Summaries in English, French and German.] 2866

The cytoplasmic and nuclear changes in infected cells are described and illustrated by photomicrographs. The identity of the viral particles causing the changes is obscure.

—T.E.G.R.

Shil'nikov, V. I. (1959). [Survival of foot and mouth disease virus in water, soil and on plants in the pre-tundra zone.] — Trud. vsesoyuz. Inst. eksp. Vet. 22, 112-119. [In Russian.] 2867

F. & M. disease virus survived in water, soil and on lichen for 2-15 days from the beginning of July when the average air temp. was 12° C., 22-30 days from the end of August when the average air temp. was 3-2° C., and for at least 30 days from the middle of September when the average air temp. was 1-3° C.—M.G.G.

Filipovitch, D. & Kendereski, S. (1960). Contribution à l'étude de l'influence de la fièvre aphteuse sur la qualité du lait de vache. [Effect of foot and mouth disease on the quality of milk.]—Bull. Off. int. Epiz. 53, 1-8. [Summaries in English and Spanish.] 2868

After F. & M. disease, milk secretion was disturbed because udder lesions had caused destruction of mammary tissue. Quality of the milk was also affected, the most characteristic change being severe reduction in the lactose content.—F.E.W.

Cottral, G. E., Cox, B. F. & Baldwin, D. E. (1960). The survival of foot-and-mouth disease virus in cured and uncured meat.—Amer. J. vet. Res. 21, 288-297. [Authors' summary modified.] 2869

To study the survival of F. & M. disease virus in cured and uncured meat, meat samples were tested in 37 experimental groups of cattle (72 test animals). Comparable and anatomically identified samples were taken from the carcasses of infected donor cattle slaughtered 33 to 35 hours after inoculation with F. & M. disease virus, type A, strain 119, at a time when viraemia was established and secondary lesions were beginning.

It was concluded that meat from animals infected with F. & M. disease was not rendered free from the virus by the usual commercial procedures of ripening, boning, salting and storage. The study showed that the virus could survive in certain tissues customarily included in such meat.

Choay, J., Dhennin, L. & Thely, M. (1960). Perturbations provoquées in vivo dans la multiplication des ribonucléotides virales. [Inhibitory action of viral ribonucleotide on foot and mouth disease in guinea-pigs.] — C. R. Acad. Sci., Paris 250, 2296-2298. 2870

Intraperitoneal inj., at 5-hourly intervals of ribonucleic acid derived from F. & M. disease virus, in polymerized or depolymerized form, delayed the appearance of lesions in g.pigs infected with F. & M. virus by foot-pad inoculation.—R.M.

I. Bradish, C. J., Henderson, W. M. & Kirkham, J. B. (1960). Concentration and electron microscopy of the characteristic particle of foot-and-mouth disease.—J. gen. Microbiol. 22, 379-391. 2871

II. Bradish, C. J., Brooksby, J. B. & Tsubahara, H. (1960). The complement-fixation test in studies of components of the virus system of foot-and-mouth disease and its antibodies.—Ibid. 392-404. 2872

III. Bradish, C. J. & Brooksby, J. B. (1960). Complement-fixation studies of the specificity of the interactions between components of the virus system of foot-and-mouth disease and its antibodies.—Ibid. 405-415. [Authors' summaries modified.] 2873

I. The infective component of the virus system of F. & M. disease was concentrated and purified by ultracentrifugation and solvent extraction. Infective materials derived from ox, g.pig, mouse, chicken, goose and tissue culture were employed. The infective concentrates (D-fractions) and the separated smaller complement-fixing components (U-fractions) were characterized by infectivity, complement-fixing activity and nitrogen content.

II. The antibody combining properties of the U- and D-fractions of the virus system were investigated by complement-fixation methods. The virus fractions were titrated in antibody excess and used as excess antigens in titrations of antisera. The results demonstrate that c.f. activity in antibody excess increased with time of incubation by a threefold or higher factor when the U-fraction was used as antigen than when the D-fraction was used. Titrations of

antisera showed that distinct combining activities were involved according to the virus fraction used as antigen in excess.

III. The type and subtype specificities of the interactions between fractions of the virus system and its antibodies were investigated by c.f. methods. Specificity is discussed in terms of a cross-fixation ratio. The 25 $\text{m}\mu$ infective component (D-fraction) combines homotypically with antibody. Thermal degradation of the 25 $\text{m}\mu$ component produces a smaller component of enhanced activity which combines heterotypically with antibody and resembles the naturally occurring 7 $\text{m}\mu$ component (U-fraction).

Wittmann, G. (1959). Nachweis von inaktiviertem Maul- und Klaunenseuche-virus mittels indirekten Neutralisationstestes. I. Mitteilung: Indirekter Neutralisationstest mit inaktiviertem Maul- und Klaunenseuche-Mäusevirus und entsprechenden Adsorbatvaccinen. [Demonstration of inactivated foot and mouth disease virus by indirect neutralization. I.] —Zbl. VetMed. 6, 797-807. [Summaries in English, French and Spanish.] 2874

Addition of formolized virus to homologous immune serum resulted in binding of the neutralising antibodies of the serum so that when active virus was subsequently added there was little or no further neutralization. This method may be used to study the antibody-binding capacity of adsorbed vaccines and their content of inactivated virus.

—R.M.

Cunha, R. G. (1960). Demonstration of immune response to foot-and-mouth disease vaccine in protection test in young adult mice.—Proc. Soc. exp. Biol., N.Y. 103, 700-703. [Author's summary modified.] 2875

F. & M. disease vaccines inoculated by the subcutaneous route in young adult mice (3-6 weeks old) conferred protection against challenge by inoculation of virus strains adapted to such mice.

Anderson, G. R., Schnurrenberger P. R., Masterson, R. A. & Wentworth, F. H. (1960). Avian embryo rabies immunization. I. Duck-embryo vaccine administered intradermally in man.—Amer. J. Hyg. 71, 158-167. [Authors' summary modified.] 2876

One to 3 intradermal injections of duck-embryo vaccine were administered to 72 persons.

49 of them received a full course of 3 i/d injections and 37 developed neutralizing antibody in the serum.

An i/d booster inoculation 171 days after initiation of the primary series produced a significant antibody rise in 43 of 46 recipients.

Wittmann, G. & Mayr, A. (1960). Experimentelle Untersuchungen über die Immunität bei Hühnerpocken unter besonderer Berücksichtigung der Schutzimpfung. [Experimental study of immunity and immunization in fowl pox.]—Zbl. Bakt. I. (Orig.) 177, 518-541. [Summaries in English, French, Spanish and Russian.] 2877

Formation of neutralizing and precipitating antibodies was studied in fowls inoculated by the feather-follicle method with egg-adapted fowl pox virus, pigeon pox virus or vaccinia virus. The effect of a booster dose after 50-70 days was also studied. The results were discussed in detail with reference to the roles of local and humoral immunity.—R.M.

Mayr, A. & Kalcher, K. (1960). Vergleichende Studien über die Züchtung von Geflügel-pockenviren in der Zellkultur. [Comparison of avian pox viruses in cell culture.]—Arch. ges. Virusforsch. 10, 72-102. [English summary modified.] 2878

Tissue cultures of chick embryo fibroblasts are suitable for culturing the viruses of fowl, pigeon, and canary pox. Virus multiplication is accompanied by cytopathic effects which permit titration of these viruses and differentiation between different strains, especially in the fowl pox group.

Continued passages were successful for all strains whereby infectivity for tissue explants increased. After the 45th passage titres of 10^{-6} I.D.₅₀ for fowl pox, 10^{-5} I.D.₅₀ for pigeon pox and $10^{-6.3}$ I.D.₅₀ for canary pox strains were obtained.

There is no relationship between the behaviour of pox viruses in explants and their virulence for fowls. The pox viruses differ fundamentally in their biological behaviour in explants from that of vaccinia virus.

Heuschele, W. P. (1960). Varicella (chicken pox) in the young anthropoid apes.—J. Amer. vet. med. Ass. 136, 256-257. [Author's summary modified.] 2879

Chicken-pox (varicella) developed in a chimpanzee, an orang-utan, and a gorilla. Signs, course, and lesions were typical of the average case in man. This is believed to be the first report of natural infection with this virus in any animal other than man.

Hetrick, F. M., Yancey, F. S., Hansen, P. A. & Byrne, R. J. (1960). Hemagglutination-

inhibition and serum neutralization response of horses to Eastern equine encephalomyelitis virus.—*Proc. Soc. exp. Biol., N.Y.* 103, 549-551. [Authors' summary modified.] 2880

Four horses inoculated with EEE virus remained asymptomatic but did develop measurable HI and neutralizing antibodies. HI antibodies were detectable earlier than neutralizing antibodies but the levels tended to drop more rapidly. Of 14 horses and ponies having significant levels of neutralizing antibody, 5 to 9 had measurable HI antibody depending on number of units of antigen employed in the test. Sera from 3 clinical cases of EEE were positive in the HI test while only one of these animals had a significant neutralizing antibody level.

Fuentes Marins, R. & Sixer, E. (1959). Aplicacion de la tecnica de precipitacion por difusion en agar en el diagnostico de la anemia infecciosa equina. [Gel diffusion test for equine infectious anaemia.]—*Bol. Inst. Invest. vet. Caracas* No. 26, pp. 11-21. 2881

Using as antigen extract of pancreas from horses in the acute stage of the disease, the test gave positive results with sera from 4 infected horses.—R.M.

Winter, H. (1960). Equine infectious anaemia. Report of a case in Brisbane and brief review of clinical and pathological aspects.—*Aust. vet. J.* 36, 79-84. 2882

The clinical history of a case, and P.M. and microscopic findings are recorded. The discussion includes a review of the literature relating to diagnosis, pathogenesis and the public health aspects. Attention is drawn to the known infections in man, and the potential danger if horses used for serum production should become infected.—N. WICKHAM.

Janiakowa, A., Janiak, T. & Koprowski, J. (1959). Zaburzenia fazy fibrinolitycznej krzepnięcia krwi w niedokrwistości zakaźnej koni. [Disturbances in the fibrinolytic phase of blood coagulation in equine infectious anaemia.]—*Weterynaria, Wrocław* No. 6 pp. 27-34. [In Polish. Summaries in English and German.] 2883

Examinations were carried out on 10 healthy and 10 infected horses. The fibrinolysis in infected horses started after 10-30 min. and lasted about 1 hour, while in the healthy animals it started after 45 min. and lasted 3-4 hours. An absolute increase in the level of antithrombin was also noted in horses with infectious anaemia.—M. GITTER.

Sharp, D. G. & Bracken, E. C. (1960). Quantitation and morphology of equine abortion virus in hamsters. — *Virology* 10, 419-431. [Authors' abst. modified.] 2884

Infection of hamsters with equine abortion virus causes a fulminating disease with death in 18-21 hours. In the latter half of this infection, plasma and extracts of liver tissue contain particles in large numbers that the authors believe are the virus elementary bodies. By electron microscopy, the particles are round with average diameter 170 m μ ; many have a tail of about 50-m μ width and variable length up to 340 m μ . They first appear about 9 hours after infection and increase rapidly to number 10¹¹ per g. in the terminal stages; they appear and increase in parallel with the infective titre. Their number is consistent with the frequency of their appearance in electron micrographs of thin tissue sections.

Bergeon, P. (1960). United Nations. Report to the government of the Sudan on production of rinderpest vaccine. pp. 13. Rome: Food and Agriculture Organization of United Nations. (FAO Report No. 1206). 2885

Rinderpest has been successfully controlled in the Republic of the Sudan for some years using freeze-dried goat-adapted virus purchased from The East African Veterinary Research Organization, Kenya at a cost of £20,000 in foreign currency.

In this report Dr. P. Bergeon who spent some eleven months in the Sudan makes detailed recommendations for the preparation of freeze-dried goat-adapted virus locally. The methods advised are conventional except that young bulls are to be used as vaccine producers instead of goats. This method developed by Mornet in Dakar is considered to be cheaper and it is stated that 20 young bulls would be sufficient to produce a year's supply of vaccine (200,000 doses per bull). On account of climatic conditions and the lack of an air-conditioned laboratory all the vaccine should be prepared in the three cool months.

Weiss, K. E. & Geyer, S. M. (1959). The effect of lactalbumin hydrolysate on the cytopathogenesis of lumpy skin disease virus in tissue culture. — *Bull. epiz. Dis. Afr.* 7, 243-254. [Summary in French. English summary modified.] 2886

Increasing the lactalbumin hydrolysate content of the nutrient medium in roller tube monolayer kidney epithelium cultures for the

propagation of Group III viruses associated with lumpy skin disease had a spectacular beneficial effect.

Flynn, D. M. (1959). **Winter dysentery of cattle.**—J. Agric. Vict. 57, 346-347. 2887

This disease, reported for the first time in Australia in June 1958, spread rapidly over the greater part of Victoria within six months of its appearance. Within herds spread was rapid and 50% or more cattle were affected, cows in milk being the most susceptible; outbreaks in beef cattle were rare; mortality was very low. The main symptoms were scouring and a sharp drop in milk production.

—L. C. LLOYD.

Baker, J. A., McEntee, K. & Gillespie, J. H. (1960). **Effects of infectious bovine rhinotracheitis-infectious pustular vulvovaginitis (IBR-IPV) virus on newborn calves.**—Cornell Vet. 50, 156-170. [Authors' summary modified.] 2888

The infectious bovine rhinotracheitis-infectious pustular vulvo-vaginitis virus was given to 10 calves shortly after birth, either intravenously, by feeding, or by contact exposure. All became ill and five became moribund. After acute signs of illness had abated, four of the other five calves that recovered showed signs referable to the respiratory tract.

Lesions and virus concentration showed good correlation. Their presence in mucosal surfaces of the mouth, oesophagus, and fore-stomach and in the liver, spleen, kidneys, and lymph nodes indicates a change in the concept that this virus has a predilection only for the respiratory or vulvovaginal tracts.

Collier, J. R., Chow, T. L., Benjamin, M. M. & Deem, A. W. (1960). **The combined effect of infectious bovine rhinotracheitis virus and Pasteurella hemolytica on cattle.**—Amer. J. vet. Res. 21, 195-198. [Authors' summary modified.] 2889

Young cattle in a controlled environment were inoculated with either infectious bovine rhinotracheitis virus or *Pasteurella hemolytica* culture, or both. Respiratory tract infections developed in each of these groups.

The intensity of clinical signs in animals given both agents was not appreciably greater than in those given them singly, but duration of illness was greater in the group given both agents. Evidence of pneumonia was obtained on auscultation of the lungs of 2 of these animals.

It is concluded that infection with the virus contributed to the seriousness of infection due to *Past. haemolytica* in cattle, although no profound potentiating effect occurred.

Olson, C., Segre, D. & Skidmore, L. V. (1960). **Further observations on immunity to bovine cutaneous papillomatosis.**—Amer. J. vet. Res. 21, 233-242. [Authors' summary modified.] 2890

Test calves were subjected to a number of vaccination treatments. A single injection with a formalized suspension of bovine wart material produced a significant degree of immunity. A single actively growing wart induced immunity to challenge with the bovine papilloma agent in nearly two thirds of the calves; nearly one third had a partial degree of immunity, and a few remained fully susceptible.

The agent of bovine papilloma propagated in chick embryos had a low degree of infectivity and no immunogenicity for calves.

It appeared from a few trials that there was a higher concentration of the agent in warts 120 days old than in a wart 60 days old. The papilloma agent was found in both the epithelial and the connective tissues of bovine warts.

Svehag, S.-E. (1960). **Effect of different "contact conditions" on the bluetongue virus-antibody reaction.**—Fed. Proc. 19, No. 1 Part 1 p. 203. [Author's abst. modified.] 2891

Regressions of the neutralized virus on serum titres were plotted for varying "contact conditions" (time and temperature factors for incubation of the virus-serum mixture), and the kinetics of virus neutralization at 37°C. by immune ovine and bovine sera was studied. The regression lines were fitted to experimental data calculated from neutralization tests in unweaned mice, chick embryos and cell cultures. Relative serum titre increased a hundredfold when a more favourable "contact condition" (24 hours at 37°) was compared with conventional methods (i.e. 1½ hours at room temp.).

Parker, H. D. (1960). **A virus of ovine abortion—isolation from sheep in the United States and characterization of the agent.**—Amer. J. vet. Res. 21, 243-250. 2892

Virus abortion of sheep is reported from Montana.

Pattison, I. H. & Millson, G. C. (1960). Further observations on the experimental production of scrapie in goats and sheep.—*J. comp. Path.* 70, 182-193. 2893

All of 56 goats developed scrapie in 5 intracerebral passages of brain suspension. The incubation period in the fifth passage was 8-11 months, compared with 15-22 months in the first passage when sheep brain was the inoculum. In a comparison of the intracerebral (i/c) and subcutaneous routes of infection, all of ten goats developed scrapie 12-15 months after i/c infection, and 8 of 10 in the 21st-31st months after s/c infection. But 4 goats given very large amounts of scrapie brain suspension s/c (10 ml. on 30 or 50 consecutive days) developed scrapie in only 11-13 months. The ability of scrapie brain to cause scrapie was not affected by treatment with ribonuclease or deoxyribonuclease, or by long distance transit by ordinary mail. No abnormal rectal temp. was recorded in 2 goats during the incubation and clinical stage of scrapie. Brain suspensions from 5 Swaledale ewes with natural scrapie produced the disease in 7 of 25 Cheviot sheep and 2 of 10 goats 14-29 months after i/c inoculation. Cerebrospinal fluid and suspensions of pituitary gland, adrenal gland, spleen, pancreas and liver from goats with scrapie caused the disease in goats inoculated i/c, but thyroid suspension did not. A goat developed scrapie 23 months after i/c injection of brain from a healthy goat. This healthy goat had been sub-inoculated 7 months before with blood from lambs with no history of scrapie, which had previously received blood from lambs born to ewes with natural scrapie. Scrapie did not develop in 28 goats kept in contact for 24-34 months with goats having clinical scrapie.—M.G.G.

Millson, G. C., West, L. C. & Dew, S. M. (1960). Biochemical and haematological observations on the blood and cerebrospinal fluid of clinically healthy and scrapie-affected goats.—*J. comp. Path.* 70, 194-198. [Authors' conclusions modified.] 2894

Haematological and biochemical tests revealed no significant difference between the blood of 10 scrapie-affected goats and 10 healthy controls; neither were biochemical differences demonstrable between the cerebrospinal fluid of 5 scrapie-affected goats and 3 healthy controls.

Damodaran, S. (1960). Ovine pulmonary adenomatosis (Jaagsiekte).—*Indian vet. J.* 37, 127-138. 2895

Four cases of pulmonary adenomatosis occurred in an Indian flock of sheep between 1956 and 1959. The disease was similar to jaagsiekte in South Africa, but with a complicating pneumonia; the diagnosis was confirmed at Onderstepoort. The affected sheep died within 3 weeks after showing signs of illness. D. described the P.M. findings and the histology of the lesions and discussed the literature.—F.E.W.

Shirlaw, J. F. (1959). Studies on jaagsiekte in Kenya.—*Bull. epiz. Dis. Afr.* 7, 287-302. [Summary in French.] 2896

Jaagsiekte, formerly known in Kenya as "Laikipia lung disease", was eradicated in 4 years on a large sheep farm by annual s/c immunization of animals with a formalized tissue vaccine prepared from lung lesions, and was reported to have been controlled by the vaccine on 50 other farms. Jaagsiekte was transmitted to healthy sheep kept in quarantine by pulmonary or intravenous inoculation or by insufflation of infected lung material. Characteristic lung lesions developed in rabbits inoculated intravenously, but mice resisted infection *via* the brain or lung. The agent, apparently a virus, underwent 70 passages in chick embryos and reproduced jaagsiekte in sheep at the 34th passage. C.f. tests with antigen prepared from the yolk sac membrane were positive for sera from sheep with jaagsiekte. Two sera also showed c.f. antibody, at low titre, for ovine abortion virus.

—M.G.G.

Derbyshire, J. H. (1960). A serological relationship between swine fever and mucosal disease of cattle.—*Vet. Rec.* 72, 331. 2897

In investigations on swine fever and mucosal disease of cattle using Ouchterlony's technique of double diffusion in agar gel, precipitin lines between antigen and antiserum systems formed a continuous line of identity in the same plate. The existence of a real serological relationship was further supported by finding that the cross relationship was maintained in numerous individual tests, that specific antibody in either system could be removed by absorption with the homologous and heterologous antigen and that no cross reactions could be obtained with antigen-antiserum systems of various other viral diseases.—A. ACKROYD.

Goret, P., Pilet, C. & Girard, M. (1959). Souches "atypiques" ou "variantes" du virus de la peste porcine isolées en France.

[Variants of swine fever virus isolated in France.] — Bull. Acad. vét. Fr. 32, 657-674. 2898

A detailed tabulated account is given of 4 strains of swine fever virus isolated in France. Like those isolated in other countries, particularly in the U.S.A., they are stable and of low virulence for adult pigs. Their main characteristics are: pneumotropism (3 of 4), marked virulence for young pigs (3 of 4), inhibition or retardation of growth (3 of 4). Under experimental conditions, 2 of the strains overcame the immunity of 2 of 5 pigs vaccinated with lapinized virus; the term "variants" is suggested for these strains.

—T.E.G.R.

Janowski, H. & Truszczyński, M. (1959). Serological studies on swine fever. I. The gel diffusion precipitin test. — Biul. Inst. Wet. Putawy 3, 6-13. [In English.] 2899

Gel diffusion tests using pig pancreas as antigen and serum from pigs or rabbits hyperimmunized against swine fever virus as antibody failed to give results that were specific for swine fever, because anti-pancreas antibodies were often present in the antisera. Such antibodies in pig serum could be eliminated almost entirely by heating the serum at 62°C. for 30 min. but they were not destroyed by heating rabbit serum. —R.M.

Mathews, J. & Buthala, D. A. (1960). Hog cholera protection tests with swine serum fractions. II. Hog cholera immune and non-immune serums. — Cornell Vet. 50, 177-182. [Authors' summary modified.] 2900

One pool of swine fever immune serum and two pools of non-immune pig serum were fractionated by ammonium sulphate. The fractions were tested for their protective ability against swine fever virus. All fractions of non-immune serum failed to protect in amounts up to 280 ml. Fractions of immune serum that contained no gamma globulin failed to protect in amounts up to 140 ml. Fractions of immune serum in amounts of 35 ml. or greater gave protection.

Nicol, L., Girard, O., Corvazier, R., Cheyroux, M., Reculard, P. & Sizaret, P. (1959). Expérimentation sur la vaccination du porc au moyen d'une souche de peste porcine lapinisée ne nécessitant pas de séroprotection. [Immunization against swine fever with strain AP3 of lapinized virus, safe to use without immune serum.] — Bull. Acad. vét. Fr. 32, 619-624. 2901

Laboratory and field tests with the AP3

strain of swine fever virus of 330th passage in rabbits revealed that the virus was avirulent and serum protection was not necessary; it did not cause local or systemic reactions; it did not affect growth nor cause abortion in pregnant sows and all piglets born were viable. A good immunity was engendered after a week and vaccinated animals were not a source of infection for unvaccinated ones.

—T.E.G.R.

Klimov, N. M., Malakhov, A. G. & Isaenko, E. P. (1959). [Purification of swine fever virus by electrophoresis.] — Trud. vsesoyuz. Inst. eksp. Vet. 22, 195-201. [In Russian.] 2902

Piglets died from swine fever when inoculated with the alpha, beta or gamma globulins, but not the albumins, of swine fever blood extracted by paper electrophoresis.

—M.G.G.

McErlean, B. A. (1960). An outbreak of paralysis in pigs with spinal demyelination (Talfan disease). — Irish vet. J. 14, 66-68. [Author's summary modified.] 2903

An outbreak of paralysis involving 4 litters of pigs on one farm in Ireland is described. The clinical syndrome and histological findings resembled Talfan disease.

Richards, W. P. C. & Savan, M. (1960). Viral encephalomyelitis of pigs. A preliminary report on the transmissibility and pathology of a disease observed in Ontario. — Cornell Vet. 50, 132-155. [Authors' summary modified.] 2904

An account of a transmissible, non-demyelinating, non-suppurative encephalomyelitis affecting principally unweaned piglets. The histology of the lesions is described, and compared with other non-suppurative encephalomyelitides of pigs. It is suggested that this disease belongs with Teschen disease, Talfan disease, and poliomyelitis suum of European pigs, and that it has existed in North America for at least 10 years.

Sibalin, M. & Lannek, N. (1960). An enteric porcine virus producing encephalomyelitis and pneumonitis in baby pigs. — Arch. ges. Virusforsch. 10, 31-45. [In English. Authors' summary modified.] 2905

The isolation in pig kidney tissue culture of a cytopathic enteric virus from pigs in Sweden is described.

Inoculation of baby pigs with this virus produced paresis after 5-9 days. P.M. changes were non-purulent encephalomyelitis

and pneumonitis. Most of the experimental animals recovered and the mortality was low.

Neutralization tests with field sera indicate that the virus or antigenically related viruses may be widely spread in the pig population. Similarities to Teschen disease, Talfan disease, benign enzootic paresis and other virus diseases were discussed.

Webster, R. G. (1959). **The isolation of orphan viruses from pigs in New Zealand.**—Aust. J. exp. Biol. med. Sci. 37, 263-269. 2906

Five strains, serologically identical, were isolated from pig faeces in pig kidney monolayer tissue cultures. They were not pathogenic for piglets or lab. animals and did not infect chick embryos, nor HeLa, bovine or dog epithelial tissue cultures. Neutralization tests suggest that infection is widespread in pigs in New Zealand. W. suggests that the strains are similar to the enteroviruses of pigs described by Beran *et. al.* [V.B. 29, 92], and, being non-pathogenic, could be included in the group known as ECSO (enteric cytopathogenic swine orphan) virus by Hsiung & Melnick [V.B. 29, 417].—N. WICKHAM.

I. Lamont, P. H. & Betts, A. O. (1960). **Studies on enteroviruses of the pig—IV. The isolation in tissue culture of a possible enteric cytopathogenic swine orphan (ECSO) virus (V13) from the faeces of a pig.**—Res. vet. Sci. 1, 152-159. 2907

II. Betts, A. O. & Jennings, A. R. (1960). **Studies on enteroviruses of the pig. V. The experimental disease induced in pathogen-free, colostrum-deprived pigs by the T80 and T 52A strains of a swine polio-encephalomyelitis virus.**—Res. vet. Sci. 1, 160-171. [Authors' summaries modified.] 2908

I. The isolation in tissue culture of a virus (V13) from the faeces of a pig is reported. In a growth curve experiment in monolayer cultures of pig kidney cells this virus reached a maximum titre of $10^{4.7}$ TCID₅₀ per ml. 78 hours after inoculation. The characteristic cytopathic changes were contraction of the cytoplasm and the formation of cytoplasmic protrusions. The size of the virus, as determined by filtration, was between 35 and 40 m μ . The virus was immunologically distinct from the T80 strain of polio-encephalomyelitis virus. No distinct clinical disease was produced in experimental pigs by V13, but the virus was recovered from the faeces of pigs after oral inoculation. The virus may therefore be an ECSO virus.

II. Both the T80 and T 52A strains of a

swine polio-encephalomyelitis virus produced clinical disease when inoculated intranasally and orally or by intracerebral injection into pathogen-free piglets deprived of colostrum. After an incubation period of 7 to 20 days, clinical signs of polio-encephalomyelitis were produced.

Virus was recovered consistently from the faeces of affected pigs and from the central nervous system and tonsils in the early stages.

The chief lesions were found in the brain stem and the spinal cord: neuronal degeneration and necrosis, perivascular cuffing and extra-vascular nodules of glial cells.

I. York, C. J., Bittle, J. L., Burch, G. R. & Jones, D. E. (1960). **An effective canine distemper tissue culture vaccine.**—Vet. Med. 55, No. 4 pp. 30-35. 2909

II. Sinha, S. K., Stewart, G., Marshall, V., Haas, H. & Hawksley, M. (1960). **Tissue culture modified canine distemper vaccine.**—Ibid. pp. 36-40. [Authors' summaries modified.] 2910

I. Tissue culture modified live virus was capable of immunizing a dog with between 1 to 8 (average 3.5) EID₅₀ of virus. Antibodies appeared as early as 5 to 8 days with inoculation of 1,000 or more EID₅₀ of virus, although a few more days were required to produce a detectable serological response if smaller amounts of virus were injected.

II. Distemper virus modified by culture in dog kidney monolayers protected 62 dogs and 15 ferrets in doses as low as 10 EID₅₀.

Anan'ev, V. A., Narskii, S. V., Bezprozvannyi, B. K. & Kuborina, L. N. (1960). [Experimental study of canine virus hepatitis. III. Tissue culture and immunological tests.]—J. Microbiol., Moscow 31, No. 3 pp. 71-75. [In Russian. Summary in English.] 2911

The "Karabash" strain closely resembled Rubarth's original strain of virus. The antigenic activity of liver depended on the presence of intranuclear inclusions.—R.M.

Chaproniere, D. M. (1960). **A change in susceptibility of guinea pig cells to myxoma virus in tissue culture.**—Virology 10, 294-307. [Author's summary modified.] 2912

Tissues from several species of unsusceptible animals were able to support the growth of myxoma virus soon after the tissue was removed from the body. The tissues of most g.pigs were an exception in that they had to be 4-5 days in culture before the myxoma virus was able to multiply in them: this slow

change in susceptibility was not due to the multiplication of a few susceptible cells. X-irradiation before cultivation prevented the tissues from ever supporting growth of virus, but when it was given after the sixth day of cultivation the ability to support virus growth was little impaired.

The implications of these findings are discussed.

Traub, E. (1960). Über die natürliche Übertragungsweise des Virus der lymphocytären Choriomeningitis (LCM) bei Mäusen und ihre Parallelen zum Übertragungsmodus gewisser muriner Krebsviren. [Natural transmission of lymphocytic choriomeningitis virus in mice and similarities in the mode of transmission of murine cancer viruses.] — Zbl. Bakt. I. (Orig.) 177, 453-471. [Summaries in English, French, Spanish and Russian.] 2913

T. paid special attention to intra-uterine transmission and transmission through semen and milk.—R.M.

Franklin, R. M. & Henry, C. (1960). The multiplication of fowl plague virus in tissue cultures of chick embryo cells.—Virology 10, 406-418. [Authors' abst. modified.] 2914

Analysis of growth of the virus suggests that the completed infective particles appear on the external cell surface and remain there for some time before they are released into the medium.

Hallauer, C. & Kronauer, G. (1960). Immunisierungsversuche mit experimentell induzierten Varianten des klassischen und atypischen Geflügelpestvirus. [Immunization experiments with experimentally-induced variants of classical and atypical fowl plague viruses.] — Arch. ges. Virusforsch. 10, 46-71. [English summary modified.] 2915

Variants of fowl plague virus and Newcastle disease virus isolated from human explants (amnion, HeLa, KB cell strains) showed a high degree of attenuation which allows inoculation by various routes of maximum doses without appreciable damage to the bird, and also excellent immunizing activity.

Mussgay, M. (1960). Vergleichende Untersuchungen über die Vermehrung eines pathogenen und eines schwach pathogenen Stammes des Virus der atypischen Geflügelpest (Newcastle-Virus). [Propagation in tissue culture of virulent Newcastle disease

virus and the attenuated Strain F.] — Zbl. Bakt. I. (Orig.) 177, 437-447. 2916

The two strains of virus were compared in respect of cytopathic action on, and proliferation in, monolayers or suspensions of chick-embryo cells. M. suggested that Strain F was poorly pathogenic for fowls because it spread slowly within the body owing to delay in liberation of virus particles from infected cells, so that sufficient antibody was formed to suppress clinical disease.—R.M.

Reuss, U. (1960). Experimentelle Untersuchungen über die Beeinflussung der atypischen Geflügelpest (New-Castle-Disease) durch Terramycininfütterung. [Influence of oral oxytetracycline on the course of Newcastle disease.] — Arch. exp. VetMed. 14, 184-2917

No difference in the course of experimental Newcastle disease and in P.M. lesions was seen, during 13 passages of the virus, in 8 to 10-week-old cockerels, between 121 birds given 10 mg. daily of oxytetracycline by mouth and 55 untreated birds. But during 13 passages in chicks, mortality in 408 chicks given oxytetracycline in the drinking water was 4-10% less than in 400 untreated chicks. The reduction in mortality was ascribed to the inhibition of secondary invaders.—M.G.G.

Reuss, U. (1959). Versuche zur aktiven und passiven Immunisierung bei der Virushepatitis der Entenküken. [Active and passive immunization experiments in ducklings against virus hepatitis.] — Zbl. VetMed. 6, 808-815. [Summaries in English, French and Spanish.] 2918

Using a strain of virus isolated in Germany, R. could not confirm Asplin's finding [V.B. 26, 3502] that a single inoculation of live virus into ducks resulted in the formation of antibodies that were transferred to the egg and protected the offspring. Ducklings hatched from the eggs of ducks given 6 inoculations of virus resisted infection at 2-3 days of age in 74 of 78 cases, but when ducks were given three inoculations only 63 of 95 offspring resisted challenge.

A strain of virus passed 70 times in hens' eggs 'lost its virulence and 0-3 ml. of amnio-allantoic fluid protected all of 64 ducklings aged 3-4 days from challenge with virulent virus 6, 8 or 12 days after inoculation.—R.M.

Sanders, F. K. (1960). Role of infective nucleic acid in the production of encephalo-

myocarditis virus.—Nature, Lond. 185, 802-804. 2919

It was suggested that infective ribonucleic acid combined with virus haemagglutinin to form a virus particle. Synthesis of ribonucleic acid within a cell did not always kill the cell.

—R.M.

Sabin, A. B. (1959). Reoviruses. A new group of respiratory and enteric viruses formerly classified as ECHO type 10 is described.—Science 130, 1387-1389. 2920

S. proposed that a group of viruses which would include ECHO type 10 and antigenically related types be renamed "reoviruses," a name derived from "respiratory-enteric orphan viruses", chosen to imply association with both the respiratory and alimentary tracts. In size, these viruses lie between the myxovirus and adenovirus group and the enteroviruses. They grow optimally in monkey kidney cultures to give cytopathic effect with distinctive cytoplasmic inclusions. They are ether-resistant and probably resemble the Coxsackie B viruses the most closely.

A list of ten properties is given for the group which all together are characteristic, though individually possessed by other groups.

It would seem that viruses having the properties described are best reclassified into a separate group, although whether the name proposed will become universally adopted is open for speculation.—J. H. DARBYSHIRE.

I. Rosen, L. (1960). Serologic grouping of reoviruses by hemagglutination-inhibition.—Amer. J. Hyg. 71, 242-249. 2921

II. Rosen, L. & Abinanti, F. R. (1960). Natural and experimental infection of cattle with human types of reoviruses.—Ibid. 250-257. 2922

I. Most members of the group were isolated from human beings, but strains have been isolated from cattle.

II. Three calves were experimentally infected with one of 3 types of reo-viruses of human origin. There was serological evidence that these animals transmitted their infections to an uninoculated animal in contact. Routine examination of blood from calves in 3 herds revealed reoviruses antigenically identical with one type of human origin (type 3) in 5 calves. Several other cattle in the herds developed haemagglutinating antibodies to two other human types of reovirus but no virus was isolated from them. No illness was

observed in the experimentally infected calves (observed daily) or those spontaneously infected.—R.M.

Mair, H. J. & Tobin, J. O'H. (1960). Some observations on the use of secondary monkey kidney cell cultures for the routine diagnosis of virus diseases.—Mon. Bull. Minist. Hlth Lab. Serv. 19, 49-54. [Authors' summary modified.] 2923

A method of trypsinizing monkey kidney cells in one laboratory and posting them to another for the preparation of secondary cultures for the diagnosis of virus diseases was found to be simple, cheap and effective.

Herrmann, E. C., Jr., Gabliks, J., Engle, C. & Perlman, P. L. (1960). Agar diffusion method for detection and bioassay of antiviral antibiotics.—Proc. Soc. exp. Biol., N.Y. 103, 625-628. [Authors' summary modified.] 2924

Agar diffusion techniques used in bacteriology were modified for use with antiviral agents. Chick embryo cell monolayers were infected with virus and overlaid with agar. Filter paper disks impregnated with the test materials were deposited on the hardened agar surface. The virus produced plaques in the cell sheet, except in the area around a disk containing an antiviral agent. Since size of the plaque-free zone was proportioned to concentration of the antiviral agent, bioassays were simply performed in the same manner as with antibacterial antibiotics.

Karrar, G. (1960). Rickettsial infection (heart water) in sheep and goats in the Sudan.—Brit. vet. J. 116, 105-114. [Author's summary modified.] 2925

An enzootic often fatal disease of sheep and goats in Eastern Sudan has been diagnosed as heartwater.

This is the first record of heartwater in the Sudan and the disease was reproduced regularly and constantly with a single intravenous injection of infective blood. Attempts to cultivate the causative organism or preserve infectivity of blood were unsuccessful. The reliability of crushed cerebral cortex, smears for diagnosis of heartwater is confirmed.

Cross-immunity between the two strains obtained from the epidemic of 1958-59 was not complete. The disease is believed to be transmitted by a hitherto unrecorded vector of heartwater, *Amblyomma lepidum*.

A possible case of heartwater in a camel was encountered.

Luoto, L. (1960). Report on the nationwide occurrence of Q fever infections in cattle.—Publ. Hlth Rep., Wash. 75, 135-140. 2926

In 1949 Q fever was recognized in 9 States of the U.S.A. Capillary-tube agglutina-

tion tests on milk or blood from 354,000 cattle revealed that it was now present in 35 States. In some States between 17 and 47% of cattle tested gave positive results, while in mountainous areas only 1% reacted. Infection appeared to be spreading.—R.M.

See also abst. 3069 (report, Australia).

IMMUNITY

Campbell, B. & Petersen, W. E. (1959). Antibodies in milk for protection against human disease.—Milchwissenschaft 14, 469-473. [In English. Summary in German.] 2927

The authors discussed the scope and public health aspects of passive immunization of man against certain diseases, by ingestion of milk from cows which produce antibodies as the result of intramammary infusion of agents of these diseases.—E.G.

Drescher, J. (1960). Über die Beziehungen zwischen Antigenzufuhr und Antikörperbildung. 1. Mitteilung. Beschreibung einer Methodik zur Gewinnung hochtitriger Immunseren mittels Antigendauerreizen.

[Relationship between antigen supply and antibody formation. I. Production of high titre immune serum by constant antigenic stimulation.] — Zbl. Bakt. I. (Orig.) 177, 149-160. [Summaries in English, French, Spanish and Russian.] 2928

G.pigs, fowls and ferrets were subjected to continuous antigenic stimulation by means of a daily i/p injection of 25-50 ml. of influenza A virus suspension for up to 52 days. Very high antibody titres developed. The higher the concentration of virus in the injections, the higher the titre. Repeated antigenic stimulation by s/c inj. of 1 ml. one or 3 times daily for 30 days induced lower titres.—M.G.G.

See also absts. 2768, 2772, 2773 (staphylococci); 2780 (TB.); 2807 (fowl typhoid); 2814, 2815 (brucellosis); 2830 (transmission of immunity to tetanus from ewe to lamb); 2832 (*Clostridium botulinum*); 2837 (combined vaccines); 2845 (pleuropneumonia); 2876 (duck-embryo rabies vaccine); 2877 (fowl pox); 2885 (rinderpest); 2890 (bovine papillomavirus); 2901 (swine fever); 2909, 2910 (dog distemper); 2915 (Newcastle disease); 2918 (duck virus hepatitis); 2956 (lungworm vaccine).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Chavarria Ch., M. & Carrillo, R. A. (1959). Eine neuartige wirksame Behandlung der durch *Oestrus ovis* Linn. ausgelösten Myiasis cavitaria. [Treatment with "Neguvon" of *Oestrus ovis* infestation in sheep.]—Zbl. VetMed. 6, 816-824. [Summaries in English, French and Spanish.] 2929

In trials on 300 sheep in Mexico, "Neguvon" (Dipterex) was given by mouth in single doses of between 30 and 300 mg./kg. body wt. A dose of 70 or 80 mg./kg. was not toxic and killed all larvae of the fly in the nasal passages. A table shows the numbers of larvae discharged from the nose or found at slaughter following treatment. The toxic dose for sheep was over 200 mg./kg., but the effects of such a large dose disappeared within 34 hours. A dose of 300 mg./kg. killed sheep within 4 hours.—R.M.

Harris, J. J., Neel, W. W. & Ellis, L. L. (1960). A study of the histological effects of *Hypoderma lineatum* (De Vill.) on gullet tissue taken from systemically treated and untreated cattle.—J. econ. Ent. 53, 280-282.

Oesophagi from calves previously treated with Co-Ral (Bayer 21/199) either as a 0.5% spray or drench (10 mg./kg.) were examined. The gullet from a sprayed calf harboured warble larvae but had no histological abnormalities; the gullet from a drenched calf was very inflamed, a result of host reaction to the insecticide as well as of the large numbers of larvae present. All the 77 larvae from the gullets of the 3 drenched calves were alive; two of the three larvae from the 3 sprayed calves were dead.—W. N. BEESLEY.

Rogoff, W. M., Kohler, P. H. & Duxbury, R. N. (1960). The in vivo activity of several systemic insecticides against cattle grubs in South Dakota.—J. econ. Ent. 53, 183-187. 2931

A drench or bolus of ronnel (Dow ET-57) at the rate of 110 mg./kg. body wt. gave almost complete control of *Hypoderma lineatum* and *H. bovis* larvae. Dimethoate intramuscularly or orally at the rate of 15 mg./kg. also gave good control but markedly depressed the cholinesterase activity. A 0.75% spray of Dowco-109 (also known as

"Narlene") was also excellent and did not depress the cholinesterase level. A 0.5% spray of Co-Ral (Bayer 21/199) gave variable results (less than 65% to about 97% control) which were not correlated with the formulation or coverage of the cattle; 0.25% spray was unsatisfactory. Nicarbazin given as a multiple oral dosage at 25 mg./kg. was unsatisfactory, but good results followed a single oral dose of 250 mg./kg. Six other chemicals, including di-n-butyl tin laurate, failed to give control. There appeared to be no correlation between warble control and weight gains.

—W. N. BEESLEY.

Bracewell, C. D. & Schurr, H. R. (1960). A field trial of two systemic insecticides for use against ox warbles.—*Vet. Rec.* 72, 281-282 & 283. 2932

Ronnel (Dow ET-57 or "Etrolene") was given by mouth or Dowco 105 ("Ruelene") was applied as a spray in 39 young Ayrshire cattle; another 13 were kept as controls. The efficacy of both compounds against warbles was confirmed. Signs of toxicity were seen in 7 cattle, but these disappeared the day after treatment.—R.M.

Claborn, H. V., Ivey, M. C. & Mann, H. D. (1960). A colorimetric method for the determination of Co-Ral in animal tissues.—*J. econ. Ent.* 53, 263-265. [Authors' summary modified.] 2933

The use of Co-Ral (Bayer 21/199) for control of ox warbles has created a demand for a method for determining residues in animal products. A colorimetric method has been developed for determining Co-Ral in fat and other tissues. The method has a sensitivity at 0.1 p.p.m. on a 50-g. sample or 0.2 p.p.m. on a 25-g. sample.

Roberts, R. H., Jones, C. M. & Gless, E. E. (1960). Methods for the evaluation of stable fly toxicants and repellents.—*J. econ. Ent.* 53, 301-303. [Authors' summary modified.] 2934

The spot test consists in applying materials to small areas on cattle and confining flies (*Stomoxys calcitrans*) on these areas at various intervals after treatment. Materials effective in this test are further evaluated by treating an entire animal and placing it in a screened cage with flies. Results of spot tests with several insecticides are presented.

Stampa, S. (1959). Tick paralysis in the Karoo areas of South Africa.—*Onderstepoort J. vet. Res.* 28, 169-227. 2935

There are four distinct types of paralysis in animals and man due to four tick species. That caused by the Karoo Paralysis Tick, *Ixodes rubicundus*, is by far the most important and is extending its range in recent years.

Studies of this tick have shown the main hosts of the immature ticks to be the *Lagomorpha* and *Menotyphla*, whereas the adults appear on domestic stock, certain species of *Artiodactyla*, the larger carnivora and less frequently on *Lagomorpha*. Activity is confined to the colder part of the year, as revealed by surveys using various methods including a special dragging technique.

The dependence of the species, particularly in the immature stages, upon types of veld vegetation capable of producing "humus mats" demonstrates the relationship between pasture management and the incidence of the tick. Tick occurrence and density in relation to veld types are indicated by a coloured map which includes the incidence of paralysis in sheep.

A study of the symptomatology under different conditions of tick infestation reveals an immunogenic response on the part of the sheep, both to the toxin and to the process of engorgement of the tick, the significance of which is discussed.

Control aspects discussed include pasture management to make the tick's environment unfavourable, and the use of dips containing the newer insecticides.

Recommendations for the control of the condition are made with indication of the measure of success which might be expected.

Stone, B. F. & Webber, L. G. (1960). Cattle ticks, *Boophilus microplus*, resistant to DDT, BHC, and dieldrin.—*Aust. J. agric. Res.* 11, 105-119. [Authors' summary modified.] 2936

Cattle ticks on a farm with a previous history of DDT-resistance, were not readily controlled by dipping in 0.05% gamma-BHC or 0.05% dieldrin after these chemicals had been in use for 10 and 4 months respectively. Spraying of steers artificially infested with ticks taken from this property 9 months later, indicated resistance to DDT and dieldrin, but not to diazinon.

In immersion tests, larvae and engorged adult females of this strain were respectively about 9 and 20 times as resistant to DDT as those of a susceptible reference strain. The engorged females were more than 700 times as resistant to dieldrin.

When tested by an injection method, the engorged adult females of this strain showed a resistance to DDT and dieldrin of 5 and 12 times respectively, some resistance to BHC, but no resistance to Bayer 21/199. Similarly tested engorged adult females of another strain taken from the property 15 months later showed a resistance to DDT of 8 times.

Wahby, A. M., Abdalla, A. & Barakat, M. Z. (1959). **N-Bromosuccinimide as an effective insecticide against Acarina.**—*Zbl. VetMed.* 6, 825-831. [In English. Summaries in French, German and Spanish.] 2937

This chemical, which has various uses in industry, was tested in Egypt on mange in 40 rabbits, 5 camels, 9 buffaloes, 10 calves and 10 horses. Application of 2% aqueous soln. 3 times daily or a 5% ointment once daily cured mange within 1 or 2 weeks. A course of treatment for a calf was estimated to cost 6d.—R.M.

Sengbusch, H. G. (1960). **Control of *Myocoptes musculinus* on guinea pigs.**—*J. econ. Ent.* 53, 168. 2938

Infested g.pigs were dipped once weekly for 3 weeks in either a 50% ethyl alcohol solution of 0.2% DMC (= Dimite, 4,4'-dichloro-*alpha*-methylbenzhydrol) or in 2% Aramite (phenoxyethyl chloro-diethyl sulphite) plus a wetting agent. Lesions

began to heal after the first treatment with each acaricide and the g.pigs were normal in 3 weeks. The animals remained free from mites for at least 8 months when kept under hygienic conditions.—W. N. BEESLEY.

Harrison, I. R. (1960). **The control of poultry red mite with 1-naphthyl-N-methyl carbamate.**—*Vet. Rec.* 72, 298-300. [Author's summary modified.] 2939

Sevin 50% wettable powder used as a spray gave good control of *Dermanyssus gallinae*. The spray did not affect egg production nor cause taint. Tests have shown that Sevin has some systemic action against this parasite.

Hoffman, R. A. (1960). **The control of poultry lice and mites with several organic insecticides.**—*J. econ. Ent.* 53, 160-162. 2940

Screening tests were carried out against lice (*Menopon gallinae*, *Menacanthus stramineus* and *Lipeurus caponis*) and the mite *Ornithonyssus sylviarum*. 0.025-1.0% sprays were used on individual birds; the litter was treated with 0.2-1.0 lb. of 4 or 5% dust per 42 sq. ft. 0.1% Co-Ral (Bayer 21/199) gave spray results comparable with those from 0.1% malathion, while Sevin and dicapthon appeared to be the most efficient litter treatments at the 0.5 lb. level of application.—W. N. BEESLEY.

See also absts. 2789 (as source of swine erysipelas); 3119 (book).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Weinbren, B. M. & Coyle, T. J. (1960). **Uganda zebu cattle naturally infected with *Fasciola gigantica* with special reference to changes in the serum proteins.**—*J. comp. Path.* 70, 176-181. [Authors' conclusions modified.] 2941

Total serum proteins were estimated and paper electrophoretic separation of the serum protein fractions effected for a group of zebu cattle infected with *F. gigantica*. These values were compared with those obtained for a group of control animals. Faecal ovum counts were done on the infected animals and P.M. examination carried out, with special attention to degree of liver damage and number of flukes in the liver.

It was shown that severe irreversible liver damage, which was not necessarily associated with a large number of flukes in the liver at the time of P.M. examination, can result from infection with *F. gigantica*.

There was a highly significant increase in

"gamma" globulin with a fall in albumin in infected animals, a finding which is consistent with a considerable degree of liver damage.

The general condition of the infected animals was strikingly poor and deteriorated throughout the period of observation.

These findings provide further evidence that *F. gigantica* infection in cattle in the enzootic areas of Uganda constitutes a serious disease problem.

Condy, J. B. (1960). **An observation on the efficiency of some anthelmintics against *Fasciola gigantica*.**—*Vet. Rec.* 72, 196. 2942

Cull cattle [presumably infested] from a ranch where the incidence of fascioliasis was high were treated with: hexachloroethane suspension; a mixture of hexachloroethane and phenothiazine in suspension; CCl_4 suspension (25% in oil) by mouth. On slaughter, 21 days after treatment, evidence of fascioliasis was seen in 62 of 243 animals. Results

were conflicting and showed only that the CCl_4 suspension and the hexachloroethane-phenothiazine mixture were inferior to hexachloroethane alone, which was not 100% efficient.—T.E.G.R.

Sharaf, A., Haiba, M. H. & Shihata, I. M. (1960). *In vitro studies on the effect of some antimalarial drugs on *Fasciola* worms in buffaloes, cattle, and sheep*.—Amer. J. vet. Res. 21, 308-310. [Authors' summary modified.] **2943**

Quinacrine hydrochloride, amodiaquine hydrochloride and pyrimethamine consistently stimulated the motor activity of *Fasciola gigantica* taken from buffaloes, cattle and sheep. Quinine sulphate produced stimulation of parasitic movement when used in small doses, and inhibition followed by stimulation when applied in larger amounts.

These antimalarial drugs do not seem to have a lethal effect on the flukes but apparently irritate them, producing excessive movements which may detach their hold on the bile ducts.

Boray, J. C. & Pearson, I. G. (1960). *Anthelmintic efficiency of tetrachlorodifluoroethane against *Fasciola hepatica* in sheep*.—Nature, Lond. 186, 252-253. **2944**

Tetrachlorodifluoroethane (Freon 112) given as a drench or by injection into the rumen at 0.15 g./lb. body wt. proved highly effective against mature liver flukes in sheep. The effect on immature flukes varied. It inhibited development and hatching of fluke eggs collected from the gall bladder. Toxicity for sheep was low. [See also V.B. 30, 462.]

—S. B. KENDALL.

Hill, D. H. & Onabamiro, S. D. (1960). *Vesical schistosomiasis in the domestic pig*.—Brit. vet. J. 116, 145-150. [Authors' summary modified.] **2945**

A Large White boar and a Tamworth sow in Nigeria developed haematuria caused by infestation of the bladder with a parasite resembling *Schistosoma haematobium*. No adult schistosomes were found. The authors were unable to find previous reports of bladder schistosomiasis in pigs, although infestation of pigs with other schistosomes had been recorded. The boar responded to treatment with lucanthone hydrochloride ("Nilodin"). All ova voided in the urine were dead. Attempts to infect pigs with cercariae from human cases failed.

McIntosh, A. & Miller, D. (1960). *Bovine cysticercosis, with special reference to the*

*early developmental stages of *Taenia saginata**.—Amer. J. vet. Res. 21, 169-177. [Authors' summary modified.] **2946**

P.M. examinations were made on 36 cattle, 28 of which had received, 1-55 weeks previously, single doses of infective eggs of *T. saginata*.

Tapeworm cysts were first observed in the musculature about 11 days after infection. The age of single infections from two to ten weeks old could be correlated with the stage of development of the cysticercus but not with the size of the connective tissue cyst or cysticercus. A scheme was outlined for the eradication of bovine cysticercosis.

Urquhart, G. M. (1960). *Diethylcarbamazine therapy in bovine cysticercosis*.—J. Parasit. 46, 234. **2947**

The drug was given by mouth to 4 steers in East Africa in doses of 10-40 mg./kg. body wt. daily for 7-10 days. The animals and 4 untreated controls were slaughtered 8-14 weeks later. Treatment did not appear to influence the incidence of living and dead cysticerci.—R.M.

Villella, J. B., Gould, S. E. & Gomberg, H. J. (1960). *Effect of cobalt 60 and X-ray on infectivity of cysticercoids of *Hymenolepis diminuta**.—J. Parasit. 46, 165-174. [Authors' summary modified.] **2948**

A dose of 12,000 roentgens equivalent physical (rep) cobalt 60 or 12,000 roentgens (r) X-ray prevented most cysticercoids from developing to tapeworms, and the few tape-worms that developed were stunted or sexually sterile. Doses of 15,000 rep cobalt 60 or 15,000 r X-ray also generally prevented development of cysticercoids.

Jonathan, O. M. (1960). *Hydatid disease in North Wales*.—Brit. med. J. April 23rd, 1246-1253. [Author's summary modified.] **2949**

A survey is made of 44 cases in man of hydatid disease in North Wales from 1948 to 1957.

Some epidemiological aspects of the disease are described. Attention is drawn to the difficulty of effective supervision of slaughterhouses in some areas.

Hydatid disease is an eradicable disease with a significant mortality rate. Though the incidence in Wales is low compared with many other sheep-rearing countries, it is higher than in other parts of the United Kingdom.

Powers, K. G., Todd, A. C. & McNutt, S. H. (1960). Experimental infections of swine with *Trichuris suis*.—Amer. J. vet. Res. 21, 262-268. [Authors' summary modified.] 2950

In pigs experimentally infected with *T. suis* the prepatent period was 41 to 45 days. The life span of the worms was 4 to 5 months; production of ova was characterized by a sharp rise followed by a rapid fall. Clinical manifestations included anaemia, anorexia, dysentry, and pronounced weight losses, regardless of age.

Trichuris suis, like *Oesophagostomum* spp., can cause "nodular disease" in pigs, the parasite penetrating the intestinal mucosa with considerable destruction and formation of nodules in the intestinal wall. Clearly, *T. suis* also can act as a provoking factor for secondary invasion with other disease-producing agents.

Armour, J. & Hart, J. A. (1960). The anthelmintic efficiency of bephenium hydroxynaphthoate against the gastro-intestinal strongyles of Nigerian zebu cattle.—Vet. Rec. 72, 306-309. [Authors' summary modified.] 2951

Field trials and critical tests were carried out with bephenium hydroxynaphthoate against the more common gastro-intestinal strongyles found in Nigerian zebu cattle using dosage rates of 125, 175 and 225 mg. per kg. body wt. At all 3 dosage rates the drug was highly effective against *Cooperia* spp. and *Oesophagostomum radiatum*, but highly efficient removal of *Haemonchus* spp. and *Bunostomum phlebotomum* was only obtained at 225 mg. per kg. At the latter level of treatment *Trichostrongylus* spp. were satisfactorily eliminated in the majority of animals, but not in all.

Rubin, R. (1960). The effect of bephenium embonate on egg production in *Nematodirus helvetianus* and other gastrointestinal nematodes in cattle.—Amer. J. vet. Res. 21, 178-180. [Author's summary modified.] 2952

Bephinium embonate given orally at 250 mg. per kg. body wt. reduced the *Nematodirus* eggs per gramme (e.p.g.) of faeces from a range of 2 to 251 on the day of treatment to none in 11 of 12 infected calves, and in the remaining calf from 28 on the day of treatment to 2 e.p.g. on the 22nd day after. The trichostrongylid egg count was reduced from a range of 1 to 25 (e.p.g.) on the day of treatment to none in 9 of the 12 calves. In the

remaining 3 calves, 2 e.p.g. was the highest trichostrongylid egg count after treatment.

The calves used were initially infected with *Nematodirus helvetianus*, *Ostertagia orloffi*, *Cooperia onchophora*, and *Trichostrongylus* sp.

Galvin, T. J., Bell, R. R. & Turk, R. D. (1960). Anthelmintics for ruminants. III. Dithiazanine iodide and bephenium embonate.—Sthwest. Vet. 13, 197-202. [Authors' summary modified.] 2953

Dithiazanine iodide and bephenium embonate were tested for anthelmintic activity, using 12 lambs and 8 calves. In lambs on pasture, multiple dosages of dithiazanine iodide seemed to prevent infection. However, single treatments of infected lambs and calves were apparently of little value at rates up to 330 mg./kg., although results were variable.

Bephinium embonate was used to treat three lambs and was apparently of little value in removing parasites of the genera represented at 250 mg./kg. body wt.

Parnell, I. W. & Dunn, A. M. (1960). Notes on some anthelmintic dosing trials on Scottish Blackface hoggs wintered on in-bye fields. Brit. vet. J. 116, 9-30. 2954

In 9 trials using 25 groups of sheep on three farms in Scotland, control and treated groups on the same farm were run together. This circumstance may have masked some of the effects of drenching since drenched animals were subjected to greater re-infestation and controls were exposed to fewer larvae than if all had remained untreated. Four anthelmintics were used. Phenothiazine was given as an aqueous suspension in doses ranging from 26 to 48 g. (usual dose range 30-40 g.) whilst three groups were given 21 to 25 g. Carbon tetrachloride was given as a 1:4 mixture with liquid paraffin, the dose being 10 ml. increasing later to 16 ml. Two preparations of copper sulphate-nicotine sulphate mixture were used: (1) 2% of copper sulphate with 2% of 40% nicotine sulphate, dose 25-32 ml.; (2) 1% nicotine sulphate with 1.6% copper sulphate, dose 32-50 ml. according to age. Drenching was done once or twice in early autumn, and once in early winter, and once in late winter or early spring. The effects of treatment were assessed by body weight, wool production and faecal worm egg count. In three trials, phenothiazine given 4 times at 26 to 48 g. resulted in significant weight gain and a slight increase in fleece weight. In four trials where the same dose

was used on 3 occasions only, significant gains in body wt. (4.8 lb.) and fleece wt. (8 oz.) were recorded. In three trials 4 drenchings with 21-25 g. of phenothiazine gave average increase of 3 lb. in body wt. and 4.1 oz. in fleece wt., but in one trial the body wt. increase was considerably greater than in the other two. Statistically significant results were not obtained with CCl_4 or with 2% nicotine mixture. In four trials, the other copper nicotine mixture gave highly significant results (body wt. increase 5.1 lb., fleece wt. increase 5.9 oz.). It is calculated that the benefit derived from anthelmintic treatment would result in an increase in cash return of 10/- a head, and with better anthelmintics or better timing of treatment, even higher gains could be achieved. In some trials, the anthelmintics were alternated but the results were not sufficiently clear-cut for adequate assessment of the best combination for routine use.

—T. E. GIBSON.

Thomas, R. E. & Jones, L. P. (1960). Lung-worm infection in the burro.—Vet. Med. 55, 38-40. [Authors' summary modified.] 2955

Cyanacethydiazide was given to 33 adult donkeys orally at 17.5 mg./kg. body wt. or by s/c inj. at 15 mg./kg. 16 days after treatment the number of *Dictyocaulus arnfieldi* larvae in the faeces was halved. The doses used were not sufficient for complete removal of lung-worms. Additional study was needed to determine the proper therapeutic dose and relative toxicity.

Jones, B. V. & Nelson, A. M. R. (1960). Lungworm vaccine in the field.—Vet. Rec. 72, 395-396. 2956

Investigations in 4,000 farms reporting symptoms of husk in cattle given lungworm vaccine revealed apparent failure of the vaccine in only 4. Pneumonia was present on 2 of these farms, and it is suggested that this or sudden exposure to heavy infection interfered with immunity.—M.G.G.

Gibbs, H. C. & Pullin, J. W. (1960). A study of the control of lungworm (*Dictyocaulus filaria*) in sheep during the winter months.—Canad. J. comp. Med. 24, 115-119. [Authors' summary modified.] 2957

A programme of rotation every four days to clean pens, plus treatment every 14 days for 16 weeks with cyanacethydiazide, appeared to be useful in controlling *D. filaria* infection in stabled sheep. Such a programme was more effective than drug therapy alone or rotation

alone, as shown by weekly larval counts, adult worms recovered P.M., and weight gains over the period of the experiment.

Kersten, W. & Becht, H. (1960). Ein Beitrag zur Pathologie der Lungenwurminfektion. [Pathology of lungworm infestation.] — Dtsch. tierärztl. Wschr. 67, 173-177. [Summary in English.] 2958

The authors studied migration of *metastrongylus* larvae in g.pigs by histological examination of the digestive and respiratory systems, 12 hours to 14 days after experimental infestation. Larvae were demonstrated in all layers of the intestine, in the mesentery, lymph nodes and vessels, heart blood, pulmonary vessels and bronchi. Migrating larvae produced hardly any reaction in tissues but their path was marked by polymorphous leucocytosis and occasionally histiocyte nodules containing either larvae or moults and often foreign body giant cells were present.—E.G.

Sen, H. G., Kelley, G. W. & Olsen, L. S. (1960). Efficacy of cyanacethydiazide against *Metastrongylus* spp., lungworms in swine.—J. Amer. vet. med. Ass. 136, 366-368. [Authors' summary modified.] 2959

Cyanacethydiazide injected s/c in 3 successive daily doses (16 mg./kg. body wt.) had only slight efficacy against *Metastrongylus* spp. in pigs. In one trial, the treatment dislodged many of the adult lungworms. No efficacy was evidenced in 2 subsequent trials. In another trial, pigs were treated 7, 21 and 42 days after infection. Egg counts of these pigs equalled the egg counts of control pigs, but diminished more rapidly.

Done, J. T., Richardson, M. D. & Gibson, T. E. (1960). Experimental visceral larva migrans in the pig.—Res. vet. Sci. 1, 133-151. [Authors' summary modified.] 2960

Visceral larva migrans has been produced experimentally in pigs by oral administration of embryonated eggs of *Toxocara canis*.

In the pig *Toxascaris leonina* larvae migrate transperitoneally and cause little tissue damage, but *T. canis* larvae migrate by the somatic route and are distributed throughout the body. Their presence in the brain and spinal cord is associated with nervous signs apparently provoked by the host reaction to static larvae rather than by the damage resulting from active migration.

The distribution of larvae and the host reaction were determined 8 days after varying

doses and at varying intervals after a standard dose of infective *T. canis* eggs.

The experimental disease is discussed in relation to visceral larva migrans in other species and to other nervous diseases of the pig.

Colglazier, M. L., Foster, A. O., Enzie, F. D. & Thompson, D. E. (1960). The anthelmintic action of phenothiazine and piperazine against *Heterakis gallinae* and *Ascaridia galli* in chickens. — *J. Parasit.* 46, 267-270. [Authors' summary modified.] 2961

Phenothiazine exhibited only slight action against *Ascaridia*, but was very effective against *Heterakis*. The dose necessary for maximum efficacy against the latter is probably above 0.5 g. per bird. When used as a feed additive, the efficacy was slightly lower than that obtained with single 1 g. doses, although the average consumption per bird was slightly more than 1 g. daily for 3 successive days. Additional information is needed on the optimum dose and on the best method for flock use.

Piperazine was effective against *Ascaridia*, but was not reliable against *Heterakis*. Moreover, administration of the chemical in drinking water for 24 hours failed to increase efficiency against caecal worms, although the intake in many birds resulted in doses considerably larger than those given by capsule. The amount of piperazine consumed by individual birds had no significant effect on anthelmintic action.

Mixtures of the two drugs produced reliable anthelmintic action against both nematodes. The efficiency against *Heterakis* was similar to that achieved with larger single doses of phenothiazine and suggest a possible potentiation.

Laing, A. B. G., Edeson, J. F. B. & Wharton, R. H. (1960). Studies on filariasis in Malaya: the vertebrate hosts of *Brugia malayi* and *B. pahangi*. — *Ann. trop. Med. Parasit.* 54, 92-99. [Authors' summary modified.] 2962

Blood surveys of wild and domestic animals carried out in East Pahang, Malaya, revealed *B. malayi* in 19 of 25 leaf-monkeys (*Presbytis obscurus*), 9 of 88 domestic cats, 1 of 44 palm-civets, 4 of 116 long-tailed macaque monkeys, 1 of 7 wild cats (*Felis bengalensis*), and 2 of 11 pangolins (*Manis javanica*). The high rate in the leaf-monkey suggests that this animal is an important reservoir of *B. malayi* (semi-periodic) but the

infections in cats are probably incidental to those in man.

B. pahangi was found in domestic cats (18 of 88), dogs (5 of 25), slow loris (*Nycticebus coucang*) (8 of 25), palm-civet (*Paradoxurus hermaphroditus*) (12 of 44), as well as in a wild cat, tiger, pangolin, moon-rat and giant squirrel.

The influence of these animal reservoirs on filariasis in man is discussed.

Shoho, C. & Nair, V. K. (1960). Studies of cerebrospinal nematodiasis in Ceylon. (VII). Experimental production of cerebrospinal nematodiasis by the inoculation of infective larvae of *Setaria digitata* into susceptible goats. — *Ceylon vet. J.* 8, 2-12. [Authors' summary modified.] 2963

Of 12 young goats 5 were inoculated with infective larvae of *S. digitata*, and 4 of these showed the nervous signs.

Three of them were killed and examined P.M.

Microscopic lesions suggestive of the destruction of the central nervous tissue by wandering nematodes were found in all three. An intact worm was not found in the brain or cord of any of the three, but in one a cuticular ring was found in the tumour-like growth under the dura mater.

There appears to be a greater resistance of the young animal to cerebrospinal nematodiasis due to *S. digitata*.

Katiyar, R. D. (1960). Lumbar paralysis amongst sheep and goats of Uttar Pradesh. — *Indian vet. J.* 37, 167-174. [Author's summary modified.] 2964

The seasonal incidence, geographical distribution, clinical symptoms and post-mortem lesions of lumbar paralysis amongst sheep and goats of Uttar Pradesh have been described.

Cultural, biological and microscopic examination of specimens and chemical analysis of blood serum samples from affected animals excluded the possibility of the disease being of bacterial, viral or nutritional origin.

Histopathological examination of the cerebrospinal system of the affected sheep and goats revealed nematode larvae and typical lesions of cerebrospinal nematodiasis.

Results obtained by treatment with diethylcarbamazine were encouraging.

Webb, J. K. G., Job, C. K. & Gault, E. W. (1960). Tropical eosinophilia. Demonstration of microfilariae in lung, liver, and

lymph-nodes.—*Lancet*, April 16th, 835-842.
[Authors' summary modified.] 2965

The pathological changes in the lung, liver, and lymph nodes of typical cases of tropical pulmonary eosinophilia in man are described.

Microfilariae have been demonstrated in the centre of nodules, suggesting that direct invasion is the cause of the lesion.

Cases are reported with lymph-node and hepatic, but without lung, involvement. A plea is made to enlarge the concept of tropical eosinophilia to include such cases, and at the same time to restrict the diagnosis to those in which a filarial infection is proved or suspected.

Microfilariae recovered from lymph-nodes have been provisionally identified as *Wuchereria bancrofti*-type; but, on the

analogy of findings in Malaya, these may be of animal origin, and zoonotic filariasis remains the most likely explanation of tropical eosinophilia.

Vasil'eva, I. N. (1960). [Ammonium nitrate for killing *Galba truncatula* snails on pastures.]—*Veterinariya*, Moscow 37, No. 2 pp. 41-43. [In Russian.] 2966

When snails were placed in 0.1% aqueous soln. of the nitrate they died within 48 hours; a 0.2% soln. killed within 12 hours. When powdered nitrate was applied to marshy places in amounts sufficient to give a conc. of 0.4% in the water, 94% of snails were killed within 6 hours. For spreading on pastures the amount recommended was 2-4 cwt. to a hectare.—R.M.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Pallaske, G. (1959). Über das sog. Mastocytom des Hundes. [Mastocytoma in dogs.]—*Zbl. VetMed.* 6, 886-897. [Summaries in English, French and Spanish.] 2967

P. described 29 cases (22 in Boxers) seen at the institute for veterinary pathology at Leipzig and discussed the nature of the neoplasm [8 photomicrographs].—R.M.

Cotchin, E. (1960). Testicular neoplasms in dogs.—*J. comp. Path.* 70, 232-248.
[Author's conclusions modified.] 2968

An account is given of testicular neoplasms in 318 dogs. Sertoli-cell tumours were the most numerous, forming the largest, or the only, testis tumour in 157 dogs, followed by seminoma (107 dogs) and interstitial-cell tumours (54 dogs). The macroscopic and histological features of the tumours are described. Reference is made to the age and breed of the animals, and to the association of tumours with (a) ectopia testis in 84 of the affected dogs, and (b) endocrine disturbances, characterized by alopecia and/or feminization, in 65 dogs. The occurrence of multiple tumours and mixed tumour types is noted. In

only 6 dogs were metastases known or suspected.

Thoonen, J. & Hoorens, J. (1960). Spontaan carcinoma in de urineblaas bij een kat. [Carcinoma of the urinary bladder in a cat.]—*Vlaams diergeneesk. Tijdschr.* 29, 147-149. [In Flemish. Summaries in English, French and German.] 2969

A papillary carcinoma occupied $\frac{3}{4}$ of the bladder of a male cat aged 14 years [3 photomicrographs]. The cat lived in a perfume warehouse.—R.M.

Szuperski, T. (1960). Lymphoma malignum u lisa srebrzystego. [Malignant lymphoma in a silver fox.]—*Med. Wet., Warszawa* 16, 86-90. [In Polish. Summaries in English and Russian.] 2970

A description of a tumour in a 5-month-old fox. On P.M. examination a tumour, the size of a hen's egg, was found in the mesentery, the mesenteric and mediastinal lymph nodes were greatly enlarged and metastases were seen in the liver and lungs. Histologically the picture resembled Hodgkin's disease in man.—M. GITTER.

NUTRITIONAL AND METABOLIC DISORDERS

Hamilton, F. J., McManus, W. R. & Larsen, L. H. (1960). An improved method of oesophageal fistulation for food intake studies in the sheep.—*Aust. vet. J.* 36, 111-112. 2971

The operative procedure in establishing

a fistula, and details of a latex plug with a flexible inner flange to seal the fistula are described. The fistula facilitates periodic sampling of material ingested by the grazing animal.—A. CULEY.

Phillips, G. D. (1960). The relationship between water and food intakes of European and zebu type steers.—*J. agric. Sci.* 54, 231-234. [Author's summary modified.] 2972

The ratios of water drunk : hay eaten were studied for groups of zebu and grade Hereford steers.

In all comparable conditions the ratio was significantly smaller for the zebras.

Restricting water to about half reduced the ratios for both types of steers.

The decrease in hay eaten resulting from restriction of water was less for the zebras.

Restricting the hay intake to approximately half increased the ratios for both groups.

The zebras drank less water than the grades.

It is concluded that the results of water restriction may not be as disastrous as would have appeared likely from the constant ratio relationship of water and food intakes previously suggested, particularly in the case of the zebu steers which have been shown to be better adapted to dry conditions.

Ross, D. B. (1960). Some observations on the effects of changes in environmental conditions and diet in ewes.—*Vet. Rec.* 72, 364-366 & 367. [Author's summary modified.] 2973

In ewes turned from loose-boxes to a permanent pasture, plasma magnesium and calcium concentrations decreased, while plasma inorganic phosphate concentrations increased. After a move from permanent pasture to a clover-mustard ley the concentrations of plasma magnesium and inorganic phosphates decreased, and calcium concentrates increased. No clinical abnormalities were detected.

Sinclair, J. H. & Kunkel, H. O. (1959). Variations in post-weaning development of ruminal mucosa in lambs.—*Proc. Soc. exp. Biol., N.Y.* 102, 57-61. 2974

42 feed-lot lambs, in 5 groups, were given a basic diet of 25% oat straw, 24% beet pulp, 14% wheat, 16% oats, 18% linseed meal and 4% sucrose, plus 650,000 i.u. of vitamin A and 48 lb. of K_2HPO_4 per ton of feed. Two groups received 10 mg./lb. feed and 20 mg./lb. feed of chlortetracycline respectively, one group received 10 mg./lb. feed of oxytetracycline and two groups received no antibiotic supplement. Each lamb was weighed daily for the 114 days trial period. Differences in weight gains between the different groups were not statistically significant taken over the

114 day period. The group receiving 20 mg. chlortetracycline showed a significantly higher average gain during the terminal 28 days. Rumen-mucosa papillary development was greatest in individuals making the greatest weight gains. The intensity of pigmentation of the rumen-reticulum mucosa was directly related to the rate of weight gain. The pigment was confined to the cornified layer of the epithelium.—A. BROWNLEE.

Milford, R. (1960). Criteria for expressing nutritional values of subtropical grasses.—*Aust. J. agric. Res.* 11, 121-137. 2975

Collective data were obtained on digestibility of 17 subtropical grass strains (of 11 species) when fed to sheep. During the growing season the crude protein (C.P.) content of these grasses was normally lower than found in temperate species. Frost further reduced the C.P. content. The correlation between C.P. content and digestibility was high. The C.P. digestibility was normally lower, and fluctuated more widely, than the dry matter (D.M.) digestibility. Positive nitrogen balances were rarely recorded for grasses containing less than 7-8% C.P. and having a C.P. digestibility of 45-50%. During the non-growing season the C.P. content of most of these grasses was inadequate to maintain a high level of animal production. The crude fibre (C.F.) content was normally high for most of the year (30-35%) and the digestibility of C.F. was higher than that of the D.M. and nitrogen and free extract. The D.M. digestibility was low by temperate standards and mainly fluctuated between 40-50%. Herbage intake was low in winter and seasonal intake variations were greater than variations in D.M. digestibility. Feeding standards based on starch equivalents and total digestible nutrients which are used in temperate regions do not appear to apply in the subtropics.—I. D. WARDROP.

Hignett, S. L. (1960). The influence of nutrition on female fertility in some of the large domestic animals.—*Proc. Nutr. Soc.* 19, 8-15. 2976

In this review the role of energy, fibre, vitamins A, D, E and B_{12} , copper, iodine, manganese, calcium, phosphorus and oestrogens in the diet of breeding cows and to a lesser extent ewes and sows, is discussed. The relationship between calcium, phosphorus and manganese is considered to be very important.

—E. J. CASTLE.

Mann, T. (1960). Effects of nutrition on androgenic activity and spermatogenesis in mammals.—*Proc. Nutr. Soc.* 19, 15-18. 2977

A dietary deficiency in male animals may cause regressive changes in the accessory glands which often precede a decline in spermatogenesis. These changes occur as a result of diminished secretion of male hormone and can be remedied by administration of androgens or anterior pituitary extracts. The author, using monozygous male twin calves, showed that underfeeding caused a greater delay in development of the androgenic activity of the testes than in the gametogenic activity. The results indicated that this was due to an initial lack of stimulation of the testes by pituitary gonadotrophin.

The dangers of overfeeding are also discussed.—E. J. CASTLE.

Brown, A. M., Cook, M. J., Lane-Petter, W., Porter, G. & Tuffery, A. A. (1960). Influence of nutrition on reproduction in laboratory rodents.—*Proc. Nutr. Soc.* 19, 32-37. 2978

In this very broad discussion of the subject no attempt is made to describe the importance of individual nutrients in detail. Topics mentioned include the management of the breeding doe, the percentage of protein required in the diet, age of weaning, availability of drinking water, palatability of food and method of administering food. The authors consider that there is a need for a new diet which would support intensive breeding and yet be palatable and not wasted by the animals.—E. J. CASTLE.

Roberts, A. H. & Scott, P. P. (1960). The influence of a meat diet on the retention of nitrogen, phosphorus and calcium in growing kittens. — *Proc. Nutr. Soc.* 19, No. 1. pp. iii-iv of Abstracts. 2979

The total gain or loss of nitrogen, phosphorus and calcium, over periods of 8 days (occasionally 4), was studied in weaned kittens. On the stock diet retentions were positive and related to the overall weight gain during the period. On a diet of un-supplemented raw heart the N and P retentions were high at first and Ca just positive or slightly negative, after several weeks N and P retentions fell markedly but remained slightly positive; Ca balances were negative. Supplementation of heart with Ca resulted in an increased retention of N, P and Ca and increased weight gain. After several weeks on the heart diet supplementation with iodine

resulted in a slight Ca retention. When Ca and I were given with raw heart good growth and retention were observed.—E. J. CASTLE.

Stout, F. M., Oldfield, J. E. & Adair, J. (1960). Nature and cause of the "cotton-fur" abnormality in mink.—*J. Nutr.* 70, 421-426. 2980

In this condition the underfur assumes a drab white colour and a flimsy texture. It causes considerable economic loss and is present throughout the U.S.A. The condition was reproduced by feeding raw, whole hake or whiting, but not by feeding cooked fish.—R.M.

I. Reid, C. S. W., Melville, A. W. & Cornwall, J. B. (1960). Bloat in cattle. XVII. A technique for recording pressure changes in the reticulo-rumen of cattle, using small electrical pressure transducers and a four-channel recorder.—*N.Z. J. agric. Res.* 3, 41-62. 2981

II. Lyttleton, J. W. (1960). Bloat in cattle. XVIII. The proteins of bovine saliva.—*Ibid.* 63-68. [Authors' summaries modified.] 2982

I. A small pressure transducer of the differential transformer type and a stable, sensitive, carrier-amplifier for use with it are described.

Techniques are given for registering pressures in different regions of the reticulo-rumen of cattle having rumen fistulae. The transducers are located internally at the points from which the recording is being made, thus avoiding the errors inherent in external measurement through pressure-conducting systems.

The equipment is versatile and can be used to record any physiological variable which may be expressed as a change of pressure, resistance or displacement.

II. The protein composition of bovine saliva has been studied by electrophoretic analysis. The major component in most samples is a mucoprotein containing sialic acid.

This mucoprotein has been isolated by fractionation, and some of its physical properties have been studied.

King, J. O. L. (1960). The effect of environmental temperature on the response of growing pigs to dietary supplements of an antibiotic and copper sulphate.—*Vet. Rec.* 72, 304-306. [Author's summary modified.] 2983

Thirty pigs were kept in groups of 3 in pens maintained at a temperature of about 65°F. and 30 others similarly at about 54°F. At each temp. 10 pigs were fed a basal diet,

10 this diet supplemented with oxytetracycline hydrochloride at the rate of 20 mg. per lb. of diet, and 10 pigs were given the basal diet plus 0·1% of copper sulphate.

On the unsupplemented diet the pigs in the warm pens grew more rapidly and utilized their food more efficiently than those in the cool pens. Both the antibiotic and the copper sulphate supplemented diets had the greater effect on weight gain and efficiency of food utilization in the pigs in the cool pens and the increased efficiency was significant in all cases. The rate of weight gain of the pigs in the warm pens was not significantly increased by either additive. The efficiency of food utilization by the pigs in the warm pens was significantly increased by the addition of copper sulphate, but not by the antibiotic.

Reid, R. L. (1960). *Studies on the carbohydrate metabolism of sheep. IX. Metabolic effects of glucose and glycerol in under-nourished pregnant ewes and in ewes with pregnancy toxæmia*. — *Aust. J. agric. Res.* 11, 42-57.

The results of glucose tolerance tests on hyperketonaemic ewes are given, with data on the changes in blood glucose and ketone levels at lambing. Data are also given on the effect of (a) intravenous glucose on blood ketones and citric acid, (b) massive subcutaneous glucose injections on blood glucose and ketones in ewes with ketosis, and (c) orally administered glycerol on blood glucose, ketones and citric acid in ewes with pregnancy toxæmia.

Fasted non-pregnant ewes utilized glucose at a slower rate than either fasted pregnant ewes, or ewes with pregnancy toxæmia. There was a relationship between the number of foetuses and the rate of glucose utilization and it was postulated that much of the glucose was removed by the foetus(es). There was a rapid rise in blood glucose levels and a decline in blood ketones at lambing. In ewes with moderate hyperketonaemia, but no clinical signs of pregnancy toxæmia, intravenous glucose reduced blood ketone levels. In ewes with pregnancy toxæmia there was usually no reduction in blood ketones in response to injected glucose, blood acetic acid levels, if previously high, did not decline, and there was no increase in blood citric acid levels. Massive subcutaneous doses of glucose given to fasted ewes at approximately 12 hour intervals were less efficiently utilized by ewes with pregnancy toxæmia than by ewes showing no clinical signs. Glycerol given orally

ewes with pregnancy toxæmia always caused a rapid decline in blood ketones, and in acetic acid if the latter was previously high; a rise in blood citric acid levels also occurred. The glycerol did not cause clinical improvement.

—I. D. WARDROP.

Barakat, M. Z., Wahby, A. M. & Abdalla, A. (1960). *Necrosis of the tail in the buffalo. A deficiency disease?* — *Brit. vet. J.* 116, 151-155.

2985

The characteristic lesions of tail necrosis of Egyptian buffaloes could be produced experimentally in rats by feeding diets devoid of essential fatty acids. Treatment with 10% formalin in both buffaloes and rats had no effect, but when diets were supplemented with egg yolk and linseed oil, lesions completely cleared. —A. ACKROYD.

Godwin, K. O. & Platt, B. S. (1960). *Pathological changes in the pars anterior of the hypophysis of animals maintained on low-protein diets*. — *Proc. Nutr. Soc.* 19, No. 1. p. x of Abstracts.

2986

The pituitary glands from 26 pigs were examined. Five of these pigs had been fed on a commercial diet, six on low protein (5%), four on low protein supplemented with 5% casein, six on low protein with additional carbohydrate, and five were recovering from protein malnutrition. The pathological changes noted in the pars anterior were: a difficulty in distinguishing the structural features under low magnification, an increase in the number of cells per field with a crowding of nuclei and loss of cytoplasm, vacuolation of cytoplasm in some portions of the gland while in other parts it was difficult to demonstrate any cytoplasm; some of the nuclei were 'hyperchromatic' and showed evidence of necrosis and small cysts were found throughout. All the changes except the last were found to regress during recovery.

—E. J. CASTLE.

Platt, B. S. & Stewart, R. J. C. (1960). *The central nervous system of pigs on low-protein diets*. — *Proc. Nutr. Soc.* 19, No. 1. pp. viii-ix of Abstracts.

2987

The spinal cords of 23 pigs were examined, 9 of which had been fed on a low protein diet, 7 low protein and carbohydrate, 2 low protein in which 5% of the starch was replaced by casein, and 5 a normal diet. In those pigs fed diets low in protein the quantity of Nissl substance in the nerve cells was reduced and the Nissl granules were dust-like,

foaming and satellitosis were present and the number of glial nuclei increased. When 20% of the starch in the low protein diet was replaced by casein nerve-cell recovery was slow and the cells were still abnormal three months later.—E. J. CASTLE.

Scott, E. B. (1960). *Histopathology of amino acid deficiencies. VI. Effect of arginine deficiency on the liver, with consideration of the testes and accessory sex glands*.—Arch. Path. 69, 390-401. [Author's summary modified.] 2988

The total omission of dietary arginine or both arginine and proline resulted in periportal liver lipidosis in male rats. The livers of proline-deficient rats were unaffected. None of these dietary deficiencies produced changes in the testicles or accessory sex glands.

Fontenot, J. P., Miller, R. W., Whitehair, C. K. & MacVicar, R. (1960). *Effect of a high-protein high-potassium ration on the mineral metabolism of lambs*.—J. Anim. Sci. 19, 127-133. [Abst. from authors' summary.] 2989

A ration simulating in composition wheat pasture (high protein and high potassium) was fed to lambs in two trials. Lambs fed this ration excreted more magnesium in their faeces than when fed a control ration. Magnesium retention was significantly decreased in one trial and slightly decreased in the other. The increased faecal excretion of Mg was associated with decreased plasma Mg. These findings are consistent with the view that rations high in protein or potassium may induce tetany by interfering with the absorption or retention of magnesium.

Rook, J. A. F. & Wood, M. (1960). *Mineral composition of herbage in relation to the development of hypomagnesaemia in grazing cattle*.—J. Sci. Fd Agric. 11, 137-143. [Authors' summary modified.] 2990

In studies of the effect of fertilizer treatment on the incidence and severity of hypomagnesaemia in grazing cows, determinations of inorganic constituents were made of herbage samples from the swards grazed. The severity of hypomagnesaemia in cows grazing plots given different fertilizer treatments, generally increased as the alkaline earth alkalinity of the herbage decreased. None of the other mineral indices had a consistent relationship with the severity of hypomagnesaemia.

Although the mineral composition of

herbage may influence the development of hypomagnesaemia, the effects of the palatability of herbage on dry matter (and hence magnesium) intake and of food factors other than minerals on the availability of herbage magnesium, preclude the use of mineral composition of herbage to assess the likelihood of the occurrence of hypomagnesaemia in grazing cattle.

Meyer, H. & Engelbertz, T. (1960). *Über den Mangangehalt von Haaren schwarzbunter Niederungsziegen und seine Beziehungen zur Fruchtbarkeit*. [Manganese content of hair in Black Pied Lowland cattle in relation to fertility.]—Dtsch. tierärztl. Wschr. 67, 124-127. [Summary in English.] 2991

The Mn content of hair from 351 cows at the end of the grazing season ranged from 4 to 50 (average 15.8) p.p.m. The conception rate was 51.6% in cows with a Mn content of below 10 p.p.m., 62.2% in cows with 10 to 20 p.p.m., and 46.3% in cows with over 20 p.p.m. The low fertility of the third group is thought to be due not to excessive intake of Mn, but to associated factors such as acidity of the soil and low intake of other minerals.

—M.G.G.

O'Dell, B. L. & Savage, J. E. (1960). *Effect of phytic acid on zinc availability*.—Proc. Soc. exp. Biol., N.Y. 103, 304-305. [Authors' summary modified.] 2992

Zinc in soya bean protein is less available than in casein. Zinc in a casein-phytic acid complex, which contains an amount of phytic acid comparable to that found in isolated soya bean protein, is also less available than that in untreated casein. Addition of calcium phytate to a casein-gelatin type diet had little or no effect on zinc availability.

Legg, S. P. & Sears, L. (1960). *Zinc sulphate treatment of parakeratosis in cattle*.—Nature, Lond. 186, 1061-1062. 2993

During 1957-59 in British Guiana, lesions were seen in cattle closely resembling those in rats fed on a zinc-deficient diet. In acute cases, parakeratosis spread over 40% of the body; muzzle, vulva, anus, top of tail, ears, back of hind limbs, knee fold, flanks and neck being affected in that order. Symptoms occurred from March-June, six cases in 1958 and in 1959 twenty among 1,000 cattle. Zinc sulphate orally (2 g./week) or by injection (1 g./week) was a rapidly effective treatment. Radiochemical balance studies show zinc absorption from the alimentary tract in steers

to be not greater than 50% : this and the low zinc content particularly of one of the pasture grasses *Trachypodon* (18 to 22 p.p.m. D.M.) indicate that the cattle did not receive adequate zinc in the diet.—E.V.L.

Cox, D. H. & Harris, D. L. (1960). **Effect of excess dietary zinc on iron and copper in the rat.**—J. Nutr. 70, 514-520. [Authors' summary modified.] 2994

Zinc toxicosis results in an accumulation of zinc in the liver with an early and marked loss of liver iron. A lowered liver copper may also occur and it may be the result of the reduced liver iron rather than an effect of the zinc. Copper probably acts in counteracting the anaemia and reduced enzyme activity of zinc toxicity by further mobilizing the iron in the liver.

Hoeffner, J. A., Miller, E. R., Ullrey, D. E., Ritche, H. D. & Luecke, R. W. (1960). **Interrelationships between calcium, zinc, iron and copper in swine feeding.**—J. Anim. Sci. 19, 249-259. [Authors' summary modified.] 2995

In 3 experiments with 158 weaning pigs the effect was studied of adding zinc (50 or 75 p.p.m.), iron (100 p.p.m.) and copper (125 p.p.m.) to control rations containing 0.55, 1.05 and 1.31% calcium. Combinations of zinc and iron, and zinc and copper were also used in two of the experiments.

Parakeratosis occurred at all three calcium levels; it was completely prevented by the addition of zinc. Iron was ineffective at the higher calcium levels in controlling parakeratosis. Copper had a significant effect on growth particularly at the higher calcium levels. Although less effective than zinc, copper reduced the incidence and severity of parakeratosis.

In two of the three experiments the addition of the trace elements resulted in a significant increase in haemoglobin and haematocrit.

Serum alkaline phosphatase levels were increased in a highly significant manner by zinc and to a lesser extent by copper.

Blood serum proteins, particularly the gamma globulin and albumin fractions, were significantly affected by the trace elements.

Bennetts, H. W. (1959). **Copper and cobalt deficiency of livestock in Western Australia.**—J. Dep. Agric. W. Aust. 8, 631-636 & 639-648. 2996

This paper reviews present knowledge on

the distribution of copper and cobalt deficiencies in Western Australia and describes the symptoms and methods of control of these deficiencies in farm animals.

Copper deficiency diseases occur almost exclusively on pastures containing less than 6 p.p.m. of copper. Much of the western and southern coastal country is Cu deficient. In the inland areas Cu deficiency is more widely scattered, less severe and more subject to seasonal variations. Only limited information is available for the northern interior regions. In severely deficient areas, animals show evidence of Cu deficiency every year, the symptoms being more apparent during the green feed period than in the dry, and in seasons favouring the growth of lush green feed. In cattle the growth of young animals is retarded and they appear unthrifty; there may be some fading of the hair colour, intermittent scouring and lowered production. If the deficiency is prolonged and severe, cows, particularly those in production, may die suddenly of heart failure ("falling disease"); Adult Cu-deficient sheep produce "stringy" or "steely" wool, and lambs may develop ataxia under conditions of severe deficiency. Young pigs also show ataxia. Adult horses appear to thrive on Cu deficient pastures, but foals show abnormalities in the structure and posture of the legs.

Cobalt deficiency is almost entirely restricted to the coastal areas and only affects ruminants. Young cattle are more susceptible than adults, and sheep, particularly lambs, are more susceptible than cattle. Response to treatment is immediate. Dual deficiency of Cu and Co causes "coast disease."

Copper is essential for both animal and plant nutrition, but cobalt is only required by the rumen bacteria. Although large doses of cobalt may result in increased liver storage it is of no value to the animal. Conversely, copper stored in the liver is available to the animal. Regular intake of both Cu and Co gives the best control of these deficiencies.

The copper requirements of sheep are approximately 10 mg. per day and of cattle 10 times this quantity. No definite information is available on copper requirements of pigs and horses. The recommended copper dose for pigs is 8 mg. per day. Cu deficiency in horses is controlled by top-dressing the pasture at the recommended rates. Copper poisoning in all animals will result if copper is given in excess of the recommended rates.

The recommended daily cobalt intakes are 1 mg. for sheep and 10 mg. for cattle.

The various methods of control of Co and Cu deficiencies (pasture top-dressing, drenching, licks, addition to the drinking water, and cobalt "bullets") are given in detail.

—I. D. WARDROP.

Hill, C. H. & Matrone, G. (1960). **Hematological responses to copper and iron deficiency in chickens.**—Fed. Proc. 19, No. 1. Part 1. p. 327. [Authors' abst. modified.] 2997

The anaemia in iron-deficient birds was hypochromic; microcytosis was not pronounced. The anaemia in copper-deficient birds was normochromic, normocytic. The difference in haemoglobin content in these chicks was accounted for entirely by the difference in erythrocyte numbers. Iron deficiency had no effect on erythrocyte numbers.

Jolly, R. D. (1960). **I. A preliminary experiment to investigate the optimum dose rate and frequency of administration of selenium to unthrifty lambs. II. A preliminary experiment on the effect of selenium on the growth rate of calves.**—N.Z. vet. J. 8, 11-12 & 13. [Author's summaries modified.] 2998

I. Selenium was administered at different dose levels and frequencies to unthrifty lambs. Growth responses were observed in all selenium-treated groups. Results suggest that small amounts of selenium given at intervals of as long as one month will improve growth rates, and that the dose rate is in the vicinity of 2·5 mg. to 5 mg.

II. As part of a composite experiment in the investigation of calf ill-thrift on 24 properties, the growth rate of 93 calves from control groups was compared with that for 115 calves that received 10 mg. or more of sodium selenate orally twice within a month: over this period the selenium-dosed calves on an average gained 52% more weight than the controls.

Drake, C., Grant, A. B. & Hartley, W. J. (1960). **Selenium and animal health. Part I: The effect of alpha-tocopherol and selenium in the control of field outbreaks of white muscle disease in lambs. II. The effect of selenium on unthrifty weaned lambs.**—N.Z. vet. J. 8, 4-6 & 7-10. [Authors' summary modified.] 2999

I. When ewes were treated during the later stages of pregnancy with either α -tocopherol or sodium selenate, α -tocopherol was of no value, but selenium appeared to

reduce early mortality in lambs from congenital white muscle disease. When lambs were given α -tocopherol or sodium selenate, α -tocopherol gave some protection from white muscle disease, whilst selenium almost completely prevented it.

II. Administration of selenium to unthrifty weaned lambs has, in most cases, given significant results. Weight gains have been accelerated and, in the more severely affected flocks, mortality reduced.

Grant, A. B., Hartley, W. J. & Drake, C. (1960). **Further observations on white muscle disease in lambs.**—N.Z. vet. J. 8, 1-3. [Authors' summary modified.] 3000

In the South Island of New Zealand for the first time, serious losses from a congenital form of the disease have been encountered. It is thought that this disease may be associated with a high incidence of barren ewes.

Welch, J. G., Hoekstra, W. G., Pope, A. L. & Phillips, P. H. (1960). **Effects of feeding fish liver oil, vitamin E and selenium to ewes upon the occurrence of muscular dystrophy in their lambs.**—J. Anim. Sci. 19, 620-628. [Authors' summary modified.] 3001

Feeding fish-liver oil to ewes during pregnancy and lactation produced muscular dystrophy in lambs. The most effective method of administration of the oil was a combination of the oil with a ground maize and corn cob mixture. The fish-liver oil lowered ewe and lamb blood plasma concentrations of vitamin E, and this reduction was associated with the incidence of dystrophy.

Vitamin E administration to ewes was effective in counteracting the dystrophy-producing effects of the oil. Vitamin E also cured dystrophic lambs.

When incorporated into the ration of ewes receiving fish-liver oil, selenium, in two of three trials, decreased but did not eliminate the occurrence of muscular dystrophy in the lambs. Selenium supplementation did not, however, alter the blood plasma tocopherol concentrations of ewes or of their lambs, nor did it alter the vitamin E concentration in the milk or the degree of unsaturation of the milk fat.

Maplesden, D. C. & Loosli, J. K. (1960). **Nutritional muscular dystrophy in calves. II. Addition of selenium and tocopherol to a basal, dystrophogenic diet containing cod-**

liver oil. — J. Dairy Sci. 43, 645-653.

[Authors' summary modified.] 3002

Nutritional muscular dystrophy was produced experimentally in Holstein-Friesian calves. The addition of cod-liver oil to the diet caused an intensification of Zenker's degeneration in the muscles of the tocopherol-deficient calves. One p.p.m. of selenium added to the basal diet did not prevent muscular dystrophy. The addition of 200 mg. of water-dispersible *d*-alpha-tocopherol acetate per calf per day completely prevented the development of muscular dystrophy in all calves so treated. All calves which were not fed tocopherol supplements developed Zenker's degeneration of the skeletal and tongue muscles and degeneration of the Purkinje fibres of the heart. Since blood serum magnesium levels declined progressively in all calves in the experiment, it is possible that low blood magnesium levels may work synergically with low blood tocopherol levels to produce Purkinje fibre degeneration.

Coggeshall, R. E. & Bieri, J. G. (1960). Pathology of the brain in single and mixed deficiencies of vitamins A and E in the chick.—

J. Nutr. 70, 272-275. [Authors' summary modified.] 3003

Brains from chicks deficient in vitamin A only had scattered pycnotic neurones, commonest in the optic tectum and Purkinje cell layer of the cerebellum. In vitamin E deficiency there were large necrotic areas in the cerebellum and occasionally in other parts of the brain. Combined deficiency of both vitamins resulted in many small acellular areas in the frontal lobes and sometimes in all parts of the brain.

Ritchie, H. D., Miller, E. R., Ullrey, D. E., Hoefer, J. A. & Luecke, R. W. (1960). Supplementation of the swine gestation diet with pyridoxine.—J. Nutr. 70, 491-496. 3004

A ration composed of 58% maize, 20% oats, 10% lucerne meal and other ingredients was supplemented with 5 mg. pyridoxine hydrochloride a pound, and it was fed from the second month of gestation to the 35th day of lactation. The supplemented diet had no effect on reproductive performance, blood picture or urinary excretion of metabolites. The offspring did not grow faster than controls but they had higher r.b.c. count and packed cell volume during the first week of life only. Attempts to produce pyridoxine deficiency in two gilts by feeding 400 mg. desoxypyridoxine daily for 3 weeks before

farrowing failed to produce acute symptoms, although chronic deficiency symptoms were observed. It was concluded that the unsupplemented diet contained enough pyridoxine (0.45 mg. a pound) for normal reproduction.—R.M.

Astrup, P., Andersen, O. S., Jørgensen, K. & Engel, K. (1960). The acid-base metabolism.

A new approach.—Lancet, May 14th, 1035-1039. [Authors' summary.] 3005

Disturbances in the acid-base metabolism have been classified according to the relation between blood values for pH, pCO_2 , and an index of non-respiratory disturbances. This index should be either bicarbonate concentration measured under standard conditions as "standard bicarbonate" or else the surplus amount, as "base excess," of fixed acid or base in mEq. per litre blood. Knowledge of the value of base excess enables the total deficit or excess of base in the blood-volume and in the extracellular space to be calculated.

An accurate bedside method, using capillary blood, for determining all relevant blood values for the identification of disturbances in the acid-base metabolism, qualitatively and quantitatively, has been devised.

Lascelles, A. K. & Setchell, B. P. (1959).

Hypothyroidism in the sheep.—Aust. J. biol. Sci. 12, 455-464. 3006

Four groups, each of 6 Merino ewes, were taken about 1 month after conception and fed the following daily intakes of methyl thiouracil—0, 0.5, 1.5 and 4.5 g.

Only 2 of the 1.5 g. group and 1 of the 4.5 g. group survived until parturition. Most of the lambs of the treated groups died soon after birth.

In the lambs of these groups the length of the ossified tibial diaphysis and the development of ossification centres were retarded.

All the treated ewes had enlarged thyroids; the lambs showed more prominent goitre. The thyroid iodine concentrations in both ewes and lambs and the maternal thyroid iodine in all treated groups were decreased, but the foetal total thyroid iodine was reduced only in the 1.5 and 4.5 g. groups. Significant reduction in plasma protein-bound iodine was only found with the lambs of these two groups. The plasma of the treated groups was higher in cholesterol, phospholipids and total fatty acids and lower in calcium.

—I. D. WARDROP.

Premachandra, B. N., Pipes, G. W. & Turner, C. W. (1960). Comparative goitrogenic

activity of tapazole and carbimazole in cattle.

—J. Anim. Sci. 19, 553-559. [Authors' summary modified.] 3007

The comparative goitrogenicity of two compounds, tapazole (1-methyl, 2-mercaptopimidazole) and carbimazole (1-methyl, 2-thio, 3-carbethoxyimidazole) was determined in cattle by I^{131} uptake suppression and by I^{131} release measurements. By the former measurement carbimazole and tapazole were found equipotent and 3 g./1,000 lb. body wt. completely blocked thyroxine secretion. By I^{131} release rate measurements, however, carbimazole was about twice as potent as tapazole in blocking thyroxine synthesis. The implications of the differences in the potency of the goitrogens by different techniques are discussed.

Peltola, P. & Krusius, F. E. (1960). **Effect of cow's milk from the goitre endemia district of Finland on thyroid function.** — Acta endocr., Copenhagen 33, 603-612. [In English.] 3008

Rats were fed for up to a year on milk from districts where goitre was endemic. Their body weight, thyroid weight, thyroidal radio-iodine uptake and serum cholesterol were compared with rats given milk from goitre-free districts. The results indicated the presence of a goitrogen in milk from goitrous districts, probably of thiouracil or thio-oxazolidone type. In goitrous districts cows more often grazed permanent pastures than in goitre-free districts.—R.M.

Clements, F. W. (1960). **Naturally occurring goitrogens.** — Brit. med. Bull. 16, 133-137. 3009

A discussion of the literature, with reference to the occurrence of goitrogens in cows' milk.—R.M.

Gould, C. M. & Grimes, F. C. (1960). **Milk fever.** — Vet. Rec. 72, 338-339 & 340. [Authors' summary modified.] 3010

The relationship between serum glutamic-oxaloacetic transaminase activity and length of recumbency in cases of milk fever was surveyed.

Possible causes were discussed.

See also abst. 3121 (book).

DISEASES, GENERAL

Ragab, M. T. & Asker, A. A. (1959). **Losses of the Friesian calves in the Tahreer Province.** — Indian J. Dairy Sci. 12, 18-26. [Authors' summary modified.] 3015

Losses of calves from birth to three years

Jönsson, G. (1960). Profylaktisk behandling av paresis puerperalis med peroral tillförsel av D-vitamin. [Prophylactic treatment of parturient paresis by oral administration of vitamin D.] — Nord. VetMed. 12, 105-112. [In Swedish. Summaries in English and German.] 3011

Daily doses of 20 million units of vitamin D₂ were given 2-5 days before calving and 1-2 days afterwards to 27 of 54 cows which had had milk fever after the previous pregnancy. 2 treated cows and 13 untreated developed milk fever.—R.M.

Robertson, A., Paver, H., Barden, P. & Marr, T. G. (1960). **Fasting metabolism of the lactating cow.** — Res. vet. Sci. 1, 117-124. [Authors' summary modified.] 3012

The yield and composition of milk from 5 cows fasted for 6 days in early lactation are recorded, as are analyses of blood taken before, during and after fasting.

Two of the 5 cows developed milk fever towards the end of the fasting period. They responded to treatment with calcium borogluconate.

Neff, A. W., Connor, N. D. & Bryan, H. S. (1960). **Studies on 9 α -fluoroprednisolone acetate, a new synthetic corticosteroid for the treatment of bovine ketosis.** — J. Dairy Sci. 43, 553-562. [Authors' summary modified.] 3013

Fluorocortisone acetate was about ten times as potent as prednisolone in its ability to elevate blood glucose in normal lactating cows. Its action on P, Na, K, Ca and Mg in the blood was studied. Trial of the drug in bovine ketosis is indicated.

Reid, R. L. (1960). **The determination of ketone bodies in blood.** — Analyst 85, 265-271. [Abst. from author's summary.] 3014

A method for accurate quantitative determination of ketone bodies was based on the conversion of all ketone bodies to acetone, distillation of acetone and its subsequent colorimetric determination by reaction with ethanolic salicylic aldehyde to form dihydroxy-dibenzene acetone in alkaline solution.

of age in Egypt were studied.

Of 784 calves born during four years the mortality rate of single calves was 16.1% while stillbirths were 2.2%.

Pneumonia and digestive troubles in-

cluding scours were the main causes of mortality and were responsible for about 70% of all deaths.

About 80% were lost before weaning. Losses in the offspring of heifers were higher than in those of cows.

High birth weight was associated with lower mortality. Mortality was highest during April and May.

van Koetsveld, E. E., Lehr, J. J. & Grashuis, J. (1960). Een onderzoek naar de oorzaken van het manen- en staarteczeem bij paarden. I. Grond- en gewasonderzoek. [Eczema of mane and tail in horses. I. Studies on soil and plants.]—Tijdschr. Diergeneesk. 85, 246-257. [In Dutch. Summaries in English, French and German.] 3016

van Koetsveld, E. E., Hammink, A. J. B. & Zegwaard, A. (1960). Een onderzoek naar de oorzaken van het manen- en staarteczeem bij paarden. II. Analyse van bloed, urine, faeces en manen. [Eczema of mane and tail in horses. II. Analysis of blood, urine, faeces and mane.]—Ibid. 381-397. [In Dutch. Summaries in English, French and German.] 3017

van Koetsveld, E. E. (1960). Een onderzoek naar de oorzaken van het manen- en staarteczeem bij paarden. III. Electroforetisch onderzoek van bloedserum. [Eczema of mane and tail in horses. III. Electrophoresis of blood serum.]—Ibid. 522-528. [In Dutch. Summaries in English, French and German.] 3018

I. This skin disease occurred during spring and summer mainly in eastern Holland, where the soils are light and sandy. Chemical analysis of soils and grasses showed that in areas where the disease occurred the grass had an abnormally low content of sodium, chlorine and iodine. Protein content was lower than normal and the authors rejected the suggestion that the disease was caused by excess protein in the diet.

II. Materials from 20 healthy horses and 20 horses with the eczema were examined chemically, and the results were compared with those from horses in areas free from the disease. Figures were given for K, Ca, Cl, Cu and N in blood and Cu and Mn in hair. It was difficult to draw any conclusions from the results obtained.

III. Blood from 16 cases was examined. Because there was little difference in protein composition from normal horses, K. concluded that it was unlikely that the skin disease resulted from disturbance in protein composition.

Holmes, J. R. (1960). Some observations on traumatic pericarditis in cattle.—Vet. Rec. 72, 355-361 & 362. [Author's summary modified.] 3019

Clinical observations are recorded on 15 cases and an attempt is made to correlate the symptoms with the lesions found P.M.

Crookshank, H. R., Keating, F. E., Burnett, E., Jones, J. H. & Davis, R. E. (1960). Effect of chemical and enzymatic agents on the formation of urinary calculi in fattening steers.—J. Anim. Sci. 19, 595-600. [Authors' summary.] 3020

Using a millet, cottonseed meal and sorghum silage ration to fatten weanling steer calves, it was found that the enzyme hyaluronidase, when given in two injections, did not prevent the formation of calculi. Both ammonium chloride and phosphoric acid were effective in reducing stone formation when added to the ration. Substitution of cottonseed hulls for a small portion of the silage in the ration had no effect.

Alexander, A. F., Will, D. H., Grover, R. F. & Reeves, J. T. (1960). Pulmonary hypertension and right ventricular hypertrophy in cattle at high altitude.—Amer. J. vet. Res. 21, 199-204. [Authors' summary modified.] 3021

Four of 10 steers after 7 months at high altitude (10,000 ft.) developed marked pulmonary hypertension. One of these 4 developed clinical signs and P.M. lesions typical of high mountain disease, and another had lesions of early cardiac decompensation.

Cardiac ventricular ratios revealed a significant right ventricular hypertrophy in the animals at the high altitude. A strong positive correlation was demonstrated between mean pulmonary arterial pressure and right ventricular mass.

The pulmonary hypertensive response at high altitude is postulated to be due to chronic hypoxia. Reduction of pulmonary arterial pressures of 2 hypertensive animals upon administration of 100% oxygen supported this hypothesis.

Harding, J. D. J. (1960). Some observations on the histopathology of mulberry heart disease in pigs.—Res. vet. Sci. 1, 129-132. [Author's summary modified.] 3022

Material from 37 pigs with suspected mulberry heart disease was examined histologically. Thirty-two cases were characterized by widespread myocardial congestion and haemorrhage with parenchymal degeneration,

mild perivascular mononuclear infiltration and frequently the presence of groups of iron-containing granules. Abnormalities were found in 2 out of 12 brains examined, but changes in liver, kidney, thyroid, lung, spleen, adrenal and skeletal muscle were considered to be non-specific.

Mulberry heart disease does not resemble the classical European Herztod.

Beilharz, R. G. & McDonald, M. W. (1960). **Possible effect of sodium potassium balance on development of uremia.**—Aust. vet. J. 36, 89-90. [Authors' summary modified.] 3023

Six groups of 50 chickens (4 weeks old) were fed for 8 weeks on diets varying in protein source and supplementation of KCl and NaCl. An outbreak of "uraemia" (avian monocytosis) occurred on a meat-meal diet, and was much more severe when a supplement of NaCl was present as well. On meat-meal diets supplemented with KCl and on diets with peanut meal as the main protein source, there was no sign of "uraemia," with or without NaCl supplementation. It was concluded that diet could affect the incidence of "uraemia."

Wolff, S. M. (1960). **Copper deposition in the rat.**—Arch. Path. 69, 217-223. [Author's summary modified.] 3024

In rats given intraperitoneal copper each day for 236 days in an attempt to produce

See also absts. 2984 (pregnancy toxæmia); 2985 (tail necrosis in buffaloes); 2993 (parakeratosis); 2999, 3000 (white muscle disease); 3001, 3002 (muscular dystrophy); 3095 (report, Belgium); 3086, 3097 (infertility).

POISONS AND POISONING

Minyard, J. A., Dinkel, C. A. & Olson, O. E. (1960). **Effect of arsanilic acid in counteracting selenium poisoning in beef cattle.**—J. Anim. Sci. 19, 260-264. [Authors' summary modified.] 3026

Three trials were conducted of the effectiveness of arsanilic acid in preventing selenium poisoning in cattle. The addition of 0.01% of arsanilic acid to a ration containing 12 p.p.m. of selenium appeared to increase rate of gain and slightly reduce selenium poisoning symptoms. In the grazing trial, feeding 550 mg. of arsanilic acid per day appeared to increase daily gains in steers on naturally seleniferous range by 0.16 lb. Treatment differences were not statistically significant in these trials. No signs of arsenical toxicity were noted.

Schultz, M. O., Klubes, P., Perman, V., Mizuno, N. S., Bates, F. W. & Sautter, J. H.

some of the histopathological changes seen in hepatolenticular degeneration, neither pathological change nor copper deposition was observed in the brain.

Groups of inflammatory cells, areas of regeneration, hyalinization, and periportal fibrosis, all compatible with early cirrhosis, were consistent findings. Large amounts of copper were found in the cytoplasm of hepatic parenchymal cells.

Degeneration and sloughing of the epithelial cells of the proximal renal tubules were noted in the animals which received copper. Specific stains revealed that copper was localized in the epithelium of the proximal convoluted tubules.

Toft, R. J. & Talmage, R. V. (1960). **Quantitative relationship of osteoclasts to parathyroid function.**—Proc. Soc. exp. Biol., N.Y. 103, 611-613. [Authors' summary modified.] 3025

A method for quantitative determination of osteoclast material in rat femurs is presented. Parathyroidectomy reduced the osteoclast count, which was subsequently returned to normal by parathyroid extract administration. Nephrectomy, continuous peritoneal lavage, and parathyroid extract administration to normal animals, all increased significantly the number of osteoclasts/unit area.

(1959). **Blood dyscrasia in calves induced by S-(dichloro-vinyl)-L-cysteine.**—Blood 14, 1015-1025. [Interlingua summary.] 3027

Daily i/v inj. of S-(dichloro-vinyl)-L-cysteine in calves—0.22 mg. per kg. for 10 days—caused severe hypoplasia of the bone marrow and blood changes reaching the highest point on the 25th-30th day of the experiment, followed by gradual recovery; 0.33-2.2 mg./kg./day for 10 days caused thrombocytopenia, leucopenia, lymphopenia and a fatal haemorrhagic syndrome. Death from causes other than haemopoietic failure may result from inj. of 4 mg./kg. If the animals survive the acute toxic effects this dose will cause haemopoietic failure and death from aplastic anaemia after about 3 weeks.

—T.E.G.R.

Coulson, C. B., Davies, P. J. & Evans, W. C. (1960). **Clinical biochemistry of farm animals. II. Amino-acid and protein patterns of**

the body fluids of cattle and sheep in disease.

— J. comp. Path. 70, 199-210. [Authors' conclusions modified.] 3028

Observations on plasma and urine amino-acids and serum proteins in cattle and sheep affected with various pathological conditions, are reported.

Ragwort poisoning induced experimentally in a calf only produced gross changes in the plasma amino-acid patterns and serum proteins shortly before death. The iodine test of Belle and Chimi was a more useful diagnostic aid. Eosinophilia and neutropenia were noted.

In cattle, field cases of bracken poisoning and the experimentally induced disease produced no gross change in plasma or urinary amino-acid patterns nor in the serum protein patterns, but plasma fibrinogen was markedly increased.

Certain other disorders of cattle and sheep have been explored by means of paper chromatography and paper electrophoresis. A more extensive series is needed before firm conclusions can be drawn.

Hill, K. R. (1960). **The world-wide distribution of seneciosis in man and animals.** — Proc. R. Soc. Med. 53, 281-283. 3029

The ingestion of plants of the genera *Senecio* (ragwort and groundsel), *Crotalaria* and *Heliotropium* causes liver degeneration necrosis in man and animals due to alkaloids of the pyrrolizidine group which they contain. The condition has been observed in children in the West Indies, South Africa and India following drinking "bush tea." In animals, it has been observed in all parts of the world in horses, cattle, goats, pigs and poultry and has been called Walking, Picton, Winton, Ždár or Schweinsberg disease, or Dunziekte. The main pathological features are occlusion of the centrilobular hepatic vein with centrilobular haemorrhagic necrosis (veno-occlusive disease), hepatocellular megalocytosis, bile duct hyperplasia and cirrhosis. The changes are probably the result of a direct hepatotoxic action by the alkaloids.

—A. ACKROYD.

Markson, L. M. (1960). **The pathogenesis of the hepatic lesion in calves poisoned experimentally with *Senecio jacobaea*.** — Proc. R. Soc. Med. 53, 283-284. 3030

In calves poisoned experimentally with *S. jacobaea*, serial biopsies of the liver showed slight parenchymal steatosis in 2-3 weeks. At 4 weeks parenchymal steatosis, bile duct

proliferation, generally increased reticulin and endothelial proliferation and degeneration with early fibrosis in the centrilobular veins were concurrently present. A week later, veno-occlusive disease (V.O.D.) and diffuse fibrosis could be seen but no centrilobular haemorrhage or necrosis. The parenchymal changes, V.O.D., and bile duct proliferation all appeared to be primary lesions and not contingent on one another. These observations do not support any of the theories put forward about the pathogenesis of seneciosis.

—A. ACKROYD.

Sedlmeier, H., Dahme, E. & Schiefer, B. (1959). Frühveränderungen an der Rattenleber nach Fütterung von *Senecio vulgaris* (Kreuzkraut) und von p-Dimethylaminoazobenzol (Buttergelb). (Eine vergleichende morphologische Betrachtung zur Entstehung primärer Lebertumoren). [Early changes in rat liver following feeding of *Senecio vulgaris* and p-dimethylaminoazobenzene.] — Zbl. VetMed. 6, 854-871. [Summaries in English, French and Spanish.] 3031

Butter yellow was mixed with the food at the rate of 0.5 g. a rat daily for 8 months. Dried pulverized groundsel was mixed with meal in a proportion of 10-15% and made into pellets. Lesions caused by each agent were compared at intervals starting 10 days after daily administration. The course of liver lesions was essentially similar in each case [17 photomicrographs]. —R.M.

Svetlicic, B. & Vandekar, M. (1960). **Therapeutic effect of pyridine-2-aldoxime methiodide in parathion poisoned mammals.** — J. comp. Path. 70, 257-271. [Authors' conclusions modified.] 3032

The therapeutic action of PAM was studied in mice, rats, rabbits, dogs and horses given parathion intravenously.

Dogs and horses poisoned with parathion, were given PAM 50 mg. per kg. i/p and 20 mg. per kg. i/v respectively. In addition to the observation of clinical symptoms the cholinesterase activity in blood was estimated. PAM reactivated the inhibited erythrocyte cholinesterase very markedly, whereas its action on the inhibited plasma cholinesterase was hardly noticeable. At lower doses of parathion, PAM showed an ability to counteract the nicotinic, muscarinic and central nervous system signs of anticholinesterase poisoning. Despite marked reactivation of the inhibited erythrocyte cholinesterase and complete disappearance of symptoms after a single

dose of PAM, next day the erythrocyte cholinesterase was again inhibited and in some instances cholinergic symptoms returned. As the conversion of parathion to paraoxon is slow, large and repeated doses of PAM should be given for prolonged therapeutic effect.

Wanntorp, H. (1960). Studies on chemical determination of warfarin and coumachlor and their toxicity for dog and swine.—Acta pharm. tox., Khb. 16, Suppl. No. 2 pp. 123. [In English.] 3033

A sensitive method is described for the quantitative determination of warfarin and coumachlor in low concentrations of the order of tenths of a mg./kg. of liver, kidney, stomach, blood, urine or intestinal contents. Toxicity experiments were made on 53 dogs and 33 pigs.

For dogs, single doses of warfarin up to 100 mg./kg. body wt. were relatively innocuous, but single doses of coumachlor as low as 5 mg./kg. were fatal, survival time being 6-13 days. Daily doses of warfarin

(0.3 mg./kg.) or coumachlor (0.2 mg./kg.) were fatal in 7-14 days. A pregnant bitch given daily doses of 0.5 mg./kg. body wt. for the 8 days before whelping produced 2 living and 2 dead pups, 4 others being dead *in utero*: the dam was weakened by excessive bleeding at parturition and was destroyed, but the foetuses were more severely affected.

For pigs, single doses of warfarin 0.5 to 45.0 mg./kg. body wt. or coumachlor 0.5 to 30.0 mg./kg. were fatal in about half the animals; higher doses of warfarin were always fatal, survival time 4-12 days. Daily doses of 0.2 or 0.5 mg./kg. warfarin and 0.1, 0.3 or 0.5 mg./kg. coumachlor proved fatal in 6-12 days.

Clinical symptoms were exhaustion, coma and sometimes swelling of the joints and haematoma of the neck, pigs were also paralysed: temperatures rose at first but were subnormal before death. At P.M. examination, haemorrhages were seen in various organs and tissues.—E.V.L.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

Lauener, J. (1959). Über die Verwendung des Syntocinon (Sandoz) zum Austreiben der Restmilch beim Rind und seine weiteren Anwendungsmöglichkeiten. (Eine Grundlage für die Mastitistherapie). [Ejection of residual milk by administering oxytocin and its clinical applications.]—Zbl. Vet. Med. 6, 832-853. [Summaries in English, French and Spanish.] 3034

The literature on oxytocin was discussed and the action of oxytocin injected i/v, s/c or i/m into cows was studied. Oxytocin therapy was indicated in bovine mastitis, uterine inertia, and agalactia in sows.—R.M.

Sapeika, N. (1960). The passage of drugs across the placenta.—S. Afr. med. J. 34, 49-56. 3035

A review of the literature with emphasis on the transfer of substances across the human placenta and their direct effect on the foetus. Methods of investigation are noted and physiological and pharmacological aspects of placental transfer discussed, but greater detail is given to drugs which may be used during pregnancy and parturition.

—JOYCE E. HAMMANT.

Blobel, H. & Burch, C. W. (1960). Concentrations of penicillin in milk of cows following intramuscular administration.—J. Amer. vet.

med. Ass. 136, 477-480. [Authors' summary modified.] 3036

Procaine penicillin G crystalline in aqueous suspension was administered i/m to 24 cows at 3,000 and 6,000 units/lb. body wt. respectively. Measurable amounts of penicillin did not persist in the milk for more than 60 hours after injection. When 3,000 or 6,000 units of procaine penicillin G crystalline in sesame oil was injected i/m into 26 cows detectable levels persisted in the milk from 36 to 132 hours.

Mills, D. W. (1960). Studies on the chronic oral toxicity of potassium penicillin G.—Arch. int. Pharmacodyn. 125, 83-95. 3037

The acute lethal dose of the penicillin given by mouth to mice weighing 24-30 g. was 6 g. for one batch of penicillin and 7 g. for another. Administration of between $\frac{1}{2}$ and 1/10 of the lethal dose daily for 9 weeks appeared to have only beneficial effects. Doses of up to $\frac{1}{2}$ the lethal dose improved weight gain. Continued daily administration of half the lethal dose decreased weight gain and appeared to cause excessive irritability.—R.M.

Hidiroglou, M. (1959). Utilisation du maléate acide d'acépromazine comme tranquillisant chez les gros ruminants. [Acetyl promazine maleate as a tranquillizer for cattle and

buffaloes.]—Rev. Elev. 22, 421-423. [Summaries in English and Spanish.] **3038**

The drug was tried in French Guiana to render previously intractable animals docile for transportation. Injected i/m into 3 buffaloes weighing 350-500 kg., a dose of 400 mg. acted within 30 min. and lasted for about 8 hours. A dose of 200 mg. seemed suitable for zebu cows weighing 400-500 kg., but the action was irregular and one cow weighing 300 kg. collapsed and died 20 min. after receiving 100 mg. In all 37 zebu cattle were treated.—R.M.

Blood, D. C. & Hayman, R. H. (1959). Chlorpromazine as a tranquillising agent in cattle.—Aust. vet. J. 35, 248-253. **3039**

To determine the efficiency of chlorpromazine as a tranquillizing agent, and its effects on heart rate, respiration, rumen movements and rectal temperature, eight calves aged 4 to 7 months were used. The drug was given by intramuscular injection in doses of 1, 1.5 and 2 mg. per kg.

The nervous reaction of treated calves to mild external stimuli was decreased but their reaction to painful stimuli remained normal. This response occurred half an hour after injection, was most marked between 1 and 2½ hours after, and had passed off in about 6 hours. Prior fasting enhanced the effect. The heart rate was increased, respiration depressed, and body temp. lowered. Side effects noted were initial restlessness, drowsiness, peripheral vasodilatation and slight ataxia. There was individual variation in response and in the response of the same calf to the same dose on different occasions.

The drug as a tranquillizing agent to permit clinical examination or the observation of experimental animals, is of doubtful value because of its effect on pulse, temperature and respiration, and because of the delay before the tranquillizing effect is obtained.

—N. WICKHAM.

Henrickson, R. L., Odell, G. V., Costello, W. J. & Reuber, H. W. (1960). Chlorpromazine residues in beef tissues.—J. Anim. Sci. 19, 26-33. [Authors' summary modified.] **3040**

Evidence is presented on the fate of chlorpromazine hydrochloride and chlorpromazine sulphoxide in cattle. An intravenous injection of 0.19 mg./lb. live weight was not sufficient to produce tranquillity; 0.25 mg./lb.

See also absts. 2795 (dequalinium chloride in bovine keratoconjunctivitis); 2818 (tetracycline in brucellosis); 2849 (bovine trypanosomiasis); 2852, 2853 (coccidiosis in fowls); 2857 (amicarlide in babesiosis); 2936-2940 (insecticides); 2942-2945, 2947, 2948, 2951-2954, 2957, 2959, 2961 (anthelmintics); 2966 (molluscicide); 2993 (zinc sulphate in treatment of parakeratosis); 3123, 3124, 3125 (books).

visibly depressed docile animals. For more excitable range stock, 0.4 mg./lb. was required.

Approximately 11 to 12% of the injected dose was lost in the urine during the first 24-hours after injection. The urine contained haemoglobin, indicating red blood cell haemolysis. Tissue was damaged at the site of intramuscular injections.

Small residual quantities were found in the fat, brain, heart, lung and kidney of those animals receiving 0.4 mg./lb. body wt. when slaughtered 8 hours after injection. Animals held for 72 hours had no detectable residual compound in any of the tissues. No residual form of the drug was found in any of the lean tissues, regardless of dose level.

When chlorpromazine hydrochloride was purposely introduced into the muscle, it was bound in the tissue. Once in this form it was not lost during the normal cooler holding period. Heat was not an adequate means of destroying the drug once it became a tissue contaminant.

Węgrzynowicz, R., Dejneka, J. & Zięba, D. (1959). Badania nad przydatnością mieszanek narkotycznej u zwierząt w doświadczeniach ostrych i zabiegach operacyjnych. [An anaesthetic mixture for animals.]—Weterynaria, Wrocław No. 6 pp. 3-17. [In Polish. Summaries in English and German.] **3041**

The mixture consisted of: chloral hydrate 2 g., 20% soln. of caffeine and sodium benzoate 0.5 ml.; 1% soln. of lobeline hydrochloride 0.1 ml. and 40% soln. of glucose 10 ml. The following i/v doses per kg. body wt. were used: sheep 1.26 ml., dogs 1.3 ml., rabbits 2.2 ml. The mixture was well tolerated and the effect lasted longer than that of chloral hydrate. Further work on the use of this mixture for horses, cattle, cats and poultry is being carried out.—M. GITTER.

Warren, A. G. (1960). A method of cyclopropane anaesthesia using a miniature portable apparatus and a non-inflammable non-explosive mixture.—Brit. vet. J. 116, 99-104. [Author's summary modified.] **3042**

The history and properties of cyclopropane are mentioned and a miniature, portable, closed-circuit anaesthesia machine is described. Prototype masks for cats and brachycephalic dogs are illustrated.

Clinical results are given and the advantages and disadvantages of the method discussed.

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Gjesdal, F. (1959). *Investigations on the melanin granules with special consideration of the hair pigment*.—Acta path. microbiol. scand. Suppl. No. 133, pp. 112. [In English.] 3043

Melanin granules in the hair of domestic animals were studied in detail at the Veterinary College of Norway. Examination by electron microscopy showed that the granules were larger in dark hair than in light hair. The size of a granule was related to its protein content. Hydrolysis of isolated granules was also studied.—A. ACKROYD.

Zhmurin, L. M. (1959). [I. Gas and energy exchange in piglets. II. Gas and energy exchange in sows.]—Trud. vsesoyuz. Inst. eksp. Vet. 22, 219-229 & 230-239. [In Russian.] 3044

After discussing results previously obtained by other Russian authors, Z. measured by Haldane's method the oxygen and carbon dioxide content of expired air collected by means of a mask. Measurements were made morning, afternoon and evening for 2-3 consecutive days during autumn, winter and spring on unweaned piglets 21-56 days old (body weight 4-13 kg.) and on sows weighing between 133 and 250 kg. The object was to obtain figures that could be used to calculate the ventilation requirements of piggeries. Average figures for piglets were: oxygen absorption 1.094 litres/hour/kg. body wt.; CO₂ excretion 0.984 litres/hour/kg.; heat production 5.33 calories/hour/kg. Average figures for sows were: oxygen absorption 0.29 litres/hour/kg.; CO₂ excretion 0.22 litres/hour/kg.; heat production 1.37 cal./hour/kg.—R.M.

Peeters, G., Stormorken, H. & Vanschoubroek, F. (1960). *The effect of different stimuli on milk ejection and diuresis in the lactating cow*.—J. Endocrin. 20, 163-172. [Authors' summary modified.] 3045

Stimuli to induce milk ejection were in order of increasing effectiveness: (1) showing the calf to the mother (visual stimulation); (2) washing the udder with warm water; (3) washing combined with visual stimulation; (4) suckling. Experimental conditions (hydration, bladder catheter) inhibited the milk-ejecting reflex induced by stimuli 1, 2 and 3. The reactions of dairy cows under these circumstances are analogous to those of primitive breeds under normal conditions.

The antidiuretic response seemed to be related to the release of oxytocin and was obtained in cows after milk ejection unaccompanied by withdrawal of milk.

The effect of known amounts of oxytocin on milk ejection was studied. The dose-response curve was nearly a straight line when log. dose was plotted against the volume of milk ejected, but the slope of the curves varied in different cows.

Haaranen, S. (1960). *Some blood components of growing pigs*.—Nord. VetMed. 12, 239-244. [In English. Summaries in German and Swedish.] 3046

Blood from 283 healthy pigs was examined for haemoglobin, minerals and serum proteins. Serum from pigs fed whey had lower Ca and Na content and higher K content than pigs fed skim milk.—R.M.

Rollinson, D. H. L. & Bredon, R. M. (1960). *Factors causing alterations of the level of inorganic phosphorus in the blood of zebu cattle*.—J. agric. Sci. 54, 235-242. [Authors' summary modified.] 3047

Calcium and inorganic phosphorus in pasture grass was studied in relation to blood levels in zebu cattle.

Excitement, adrenaline injections and fatigue were possible causes of variations in the inorganic-phosphorus levels of the blood.

Sudden rainfall appeared to cause alterations in the inorganic phosphorus levels of blood. Tests on two separate batches of cattle on two occasions revealed a relationship between water intake and the blood level of inorganic phosphorus.

Water starvation caused a steady increase in the level of inorganic phosphorus and when water was made available the inorganic phosphorus level fell rapidly to a subnormal level before returning to normal.

Fantl, P. & Ward, H. A. (1960). *Clotting activity of maternal and foetal sheep blood*.—J. Physiol. 150, 607-620. 3048

A comparison of thromboplastin components, the prothrombin complex, fibrinogen activity and clotting time of blood from 17 ewes and their foetuses (exposed by caesarian section).—R.M.

Roshchhevskii, M. P. (1960). [Coefficient of arrhythmia of heart function in cattle and its changes with age.]—Doklady Akad. Nauk SSSR 131, 1213-1214. [In Russian.] 3049

The coefficient was calculated by sub-

tracting the minimum R-R interval of the electrocardiogram from the maximum R-R interval and dividing the product by the minimum R-R interval $\times 100$. In 160 cattle it decreased with increasing age from 3 weeks to 8 years.—R.M.

Hamlin, R. L. (1960). The QRS electrocardiogram, epicardiogram, vectorcardiogram and ventricular excitation of swine. — Amer. J. Physiol. 198, 537-542. 3050

Excitation of the left ventricle started in the interventricular septum from left to right, then in the free wall of the ventricle from endocardium to epicardium, finally at the base of the ventricle in an apical-basilar direction. The findings were similar to those obtained in other mammals (excluding ruminants and horses).—R.M.

Mitropolitanskaya, R. L. (1960). [Influence of the autonomic system on heart function of Karakul lambs.]—Sechenov J. Physiol. 46, 318-325. [In Russian. Summary in English.] 3051

Black and grey (albino) lambs were compared. Grey lambs were born weak and often developed fatal chronic tympanites after weaning. In grey lambs the heart rate was slower and the electrocardiogram was different from black lambs. It was considered that grey lambs had deficient tone in the parasympathetic system of the gastro-intestinal tract and increased tone in that part concerned with heart function.—R.M.

Kay, R. N. B. (1960). I. The rate of flow and composition of various salivary secretions in sheep and calves. II. The development of parotid salivary secretion in young goats.—J. Physiol. 150, 515-537 & 538-545. [Author's summaries modified.] 3052

I. The salivary glands of sheep and calves were weighed. The small serous and mucous glands of the mouth constitute a considerable part of the total salivary gland mass. The distribution and histology of the glands are described.

In conscious sheep 1-4 litres of parotid saliva and 185-375 ml. of submaxillary saliva were collected from single glands per day. The compositions of these secretions are compared.

The changes in the composition of parotid saliva caused by sodium depletion and by changing the rate of secretion that have been reported by previous workers are confirmed.

II. The rate of secretion and composition of

parotid saliva were studied in anaesthetized goats that were between 2 days and 16 months old.

In goats less than five weeks old there is very little resting secretion and the stimulated rates of secretion are only about one third of the adult rate. The rates of secretion increase to reach the adult level in 3-month-old goats.

The concentrations of bicarbonate and phosphate in the saliva vary considerably with the rate of secretion. The concentration of chloride is above adult levels for the first 3 weeks.

In goats less than 3 months old the parotid gland is histologically immature.

Bell, F. R. (1960). The electroencephalogram of goats during somnolence and rumination. — Animal Behaviour 8, 39-42. [Author's summary modified.] 3053

The EEG of alert goats is similar to the asynchronous pattern noted in other species.

Goats do not sleep like non-ruminant species. They do exhibit periods of somnolence, however, when the EEG shows a hypersynchronous character similar to that recorded in other species in deep sleep or during anaesthesia. During rumination the EEG is indistinguishable from the pattern recorded during somnolence.

The possible connexion between somnolence, rumination and the activity of the brain-stem reticular formation is discussed in relation to anatomical and biochemical differences between the Bovidae and other species.

Dunstone, J. R. & Payne, E. (1959). Some effects of fluoride on calcium metabolism in the bones of young rats.—Aust. J. biol. Sci. 12, 466-478. 3054

Seven-week-old rats were fed sodium fluoride 400 p.p.m. daily. On the 30th and 31st days each was injected with 17.6 μ c ^{45}Ca . Groups of rats were killed at 18 hours, 10 and 30 days after this injection.

No marked bone abnormalities were indicated by X-ray.

Radioautography indicated that throughout the epiphyseal and trabecular regions of the femora and humeri ^{45}Ca was retained to a greater degree than in the controls.

The bones of the treated animals showed greater overall ^{45}Ca activity, particularly in the lumbar and cervical vertebrae.

Although there were few significant differences between the Ca contents of the bones of the two groups, there was some

evidence that Ca was deposited and resorbed at a slower rate in the fluoride treated animals. The ash content of the bones showed a similar trend and was also higher in the treated animals, particularly in the group killed 10 days after ^{45}Ca injection.

Of all the bones studied the humerus was the least affected by fluoride ingestion.

—I. D. WARDROP.

Ketz, H.-A. (1960). Vergleichende Betrachtungen über die renale Elektrolytausscheidung bei den Haustieren. [Comparative studies on the renal excretion of electrolytes in domestic animals.] — *Zbl. VetMed.* 7, 327-338. [Summaries in English, French and Spanish. English summary modified.] 3055

Values for the absolute and relative renal excretion of sodium, potassium, chloride and calcium, as well as the total inorganic and organic phosphate in horses, cattle, sheep, goats and pigs are compared with one another and with the corresponding values in man.

Renal clearance of these electrolytes, except potassium, is higher in unweaned animals than in adults. This is explained by the higher electrolyte supply in the milk.

In unweaned animals there is a renal excretion of more than 50% for sodium, potassium and chloride, less than 50% for phosphate and less than 1% for calcium, expressed in each case in relation to the amount ingested. The relative renal excretion expressed in terms of area of body surface is of the same order for most electrolytes in domestic animals as it is in man. [Further details of this work appear in *Arch. exp. VetMed.* 14, 283-335.]

Samiy, A. H. E., Brown, J. L., Globus, D. L., Kessler, R. H. & Thompson, D. D. (1960). Interrelation between renal transport systems of magnesium and calcium. — *Amer. J. Physiol.* 198, 599-602. 3056

Infusion of magnesium chloride solution greatly increased renal excretion of calcium in dogs. This and other findings supported the idea that Mg and Ca compete for a common re-absorptive system in the renal tubules.

—R.M.

Berger, L., T'sai Fan Yü & Gutman, A. B. (1960). Effect of drugs that alter uric acid excretion in man on uric acid clearance in the chicken. — *Amer. J. Physiol.* 198, 575-580. 3057

Renal clearance studies showed that in fowls tubular secretion accounted for 80% of urate in urine. The drugs probenecid,

sulfinpyrazone, zoxazolamine and phenylbutazone, which increase uric acid excretion in man, decreased uric acid excretion in fowls.—R.M.

Mounib, M. S. & Evans, J. V. (1960). The potassium and sodium contents of sheep tissues in relation to the potassium content of the erythrocytes and the age of the animal. — *Biochem. J.* 75, 77-82. 3058

A study of 63 sheep 4-8 years old and of 88 yearlings. Results are tabulated.—R.M.

Bell, D. J. (1960). Tissue components of the domestic fowl. 4. Plasma-alkaline phosphatase activity. — *Biochem. J.* 75, 224-229. [Author's summary modified.] 3059

Both adult non-laying hens and cocks show enzymic activity of the same order. The plasma of immature birds (5-6 weeks old) of both sexes has up to ten times the alkaline-phosphatase found in non-laying adults. In hens the average level of plasma enzymic activity is increased by about 50% upon the bird coming into lay. The massive temporary increases in plasma phosphatase in laying hens are believed to reflect a stimulation of the osteoblastic recalcification process called into action by the drain on skeletal calcium caused by egg-shell formation.

Lührs, E. (1960). Beobachtungen über den Harnstoffgehalt des Blutes von Kälbern während des Winters. [Urea content of the blood of calves during winter.] — *Berl. Münch. tierärztl. Wschr.* 73, 129-132. [Summary in English.] 3060

The urea content of the blood of 20 calves on 2 farms was about 45 mg.% at the end of the grazing season. It decreased during the first 6-11 weeks of stall feeding and tended to stay at 6-11 mg%. Prolonged feeding of small amounts of silage caused a slow rise.—M.G.G.

Annison, E. F. (1960). Plasma non-esterified fatty acids in sheep. — *Aust. J. agric. Res.* 11, 58-64. [Author's summary.] 3061

Concentrations of plasma non-esterified fatty acids (NEFA) in sheep were found to be within the range 0.1-0.9 m-equiv/l. Relatively high levels (1.0-2.5 m-equiv/l) occurred in pregnant and non-pregnant sheep when fasted. Intravenous injection of glucose (1.0 g/kg. body wt.) depressed NEFA concentrations to levels of about 0.05 m-equiv/l. Insulin, injected intravenously, caused an initial fall in the NEFA level, followed by a sharp rise which was maintained throughout

hypoglycaemia. These results suggest that in sheep, as in many other species, NEFA are of major metabolic importance.

McFarland, L. Z., Clegg, M. T. & Ganong, W. F. (1960). Concentration of ACTH in cavernous sinus and peripheral blood collected from unanesthetized sheep. — Proc. Soc. exp. Biol., N.Y. 103, 538-539. [Authors' summary modified.]

3062

A simple technique for puncturing the cavernous sinus of unanaesthetized sheep through the foramen ovale is described. Plasma from this sinus showed at least a two-fold greater concentration of ACTH than peripheral plasma collected simultaneously from the recurrent tarsal vein.

Heyndrickx, G. V. & Peeters, G. J. (1960). Concentration of sugars, ketone bodies and some organic acids in udder lymph and plasma of cattle. — Biochem. J. 75, 1-3. [Authors' summary modified.]

3063

See also absts. 3120, 3122 (books).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

Singer, L. & Armstrong, W. D. (1960). Removal of strontium from milk. — Nature, Lond. 186, 484-485.

3065

Up to 75% of the strontium-85 content was removed from milk flowing through a column of pulverized protein-free or fat-free bone treated with 4 N calcium chloride soln. and/or 8 N potassium hydroxide soln. Used bone could be regenerated repeatedly. Protein-free bone caused less alteration of the ionic composition of the milk than fat-free bone.

—M.G.G.

Fernqvist, N., Arnsmeyer, F. W., Rouy, H. & van Deth, A. (1959). Slaughterhouse facilities and meat distribution in O.E.E.C. countries. pp. 66. Paris: The European Productivity Agency, Organisation for European Economic Co-operation. [Project No. 285.]

3066

A survey was made in Member countries of the Organisation.

It does not follow that reducing the links in the marketing chain makes for greater efficiency, and in the countries visited (Austria, France, Italy and Holland) the predominating system of distribution was "producer—livestock market—slaughterhouse in consumption centre—butcher and consumer." The holding of livestock markets only once or twice a week leads to inefficient

Continuing previous work [V.B. 29, 3982] the authors found that concentrations of glucose and fructose are lower and that of lactose is higher in lymph than in plasma. There was more free acetone in lymph than in plasma, although the conc. of acetoacetic acid was almost the same in each fluid.

There was more alpha-oxoglutaric acid, citric acid and especially lactic acid in lymph than in plasma; but the pyruvic acid content of lymph was below that of plasma.

Smith, A. G. & Cress, H. V. (1960). Histochemical variations with age in roosters' testes. — Arch. Path. 69, 374-381. [Authors' summary modified.]

3064

Tissue cultures of testicles from cocks of all ages had similar morphology and similar histochemical reactions. One 5-year-old cock that had morphological evidence of ageing in its testicles also had different histochemical reactions from those of younger birds.

utilization of the slaughterhouses, and meat markets rather than livestock markets may have a considerable economic advantage.

Slaughter conditions varied greatly and public abattoirs were in most cases established at comparatively high cost as a result of the need for centralized slaughter in towns. Privately operated abattoirs were generally laid out more efficiently and cost less to run. Operating costs varied widely, depending on the extent to which the capacity available was utilized and on the efficient organization of work. There is a waste of capacity in many slaughterhouses in Europe, particularly in public abattoirs. Costs of slaughtering are lower in production areas than in consumer areas, and certain municipal slaughterhouses in Germany, Austria and Italy are empowered to impose dues on meat slaughtered outside the municipality.

Price fluctuations are common in countries where livestock marketing predominates, particularly in the case of pigs, and in Germany weekly fluctuations in pig prices have in recent years averaged 3-4%. In all countries differences in price between the various joints have tended to increase as there has developed an increasing selectivity in consumer demands. The Report stresses the value of a grading system in which the producer is paid on deadweight and quality, and

considers that O.E.E.C. should take the initiative towards the development of a grading system for carcasses and meat. Full use should be made of the experience in Sweden where a grading system has been in existence for 20 years and where beef is divided into 12 grades; only four or five of the better grades are sold as joints in retail shops, the remainder providing the ingredients for made-up foods. Useful Annexes to the Report cover such subjects as Live Slaughter of Cattle and Pigs, Grading of Carcasses and Cuts, Utilization of Offal, and Cooling Facilities in Slaughterhouses.—H. THORNTON.

Rowley, I. (1959). Bait size for rabbits. — C.S.I.R.O. Wildlife Res. 4, 27-30. [Author's summary.]

3067

The factors affecting bait size for poisoning rabbits are discussed, and the results of two experiments show that rabbits prefer a bait weighing about 5 g. ($\frac{1}{2}$ in. cube) to baits less than 2 g. ($\frac{1}{4}$ in. cube) or as large as 10 g. ($\frac{3}{4}$ in. cube).

Griffiths, M. E. (1959). The effect of weathering on the toxicity of baits treated with sodium fluoroacetate. — C.S.I.R.O. Wildlife Res. 4, 93-95.

3068

Tests were carried out to determine the rate of decrease of "1080" in baits (treated carrot and unhusked oats) exposed to average weathering conditions. Carrots became innocuous after 3 weeks' exposure, but oats retained poisoning potency up to the 7th week. It is suggested that where it is not practicable to cover or remove baits after poisoning, carrot is the bait of choice if stock is to be returned to treated paddocks quickly.

—A. CULEY.

Australia. (1960). Report of the Director-General of Health, July 1, 1956 - June 30, 1958. pp. 137. Canberra: A. J. Arthur, Govt. Printer. [Animal quarantine and veterinary hygiene pp. 78-81.]

3069

The report lists alterations in the Quarantine Act, during the two years ending June 1958. These dealt with the importation

See also absts. 2809 (salmonella in imported meat); 2927 (antibodies in cows' milk for immunization of man against disease); 3126 (book).

LIVESTOCK HYGIENE

Szép, I. (1960). Über die Wirkung hoher Außentemperatur auf die Futteraufnahme, Futterverwertung und Körpertemperatur der Mastrinder in verschiedenen Stalltypen. [Action of high environmental temperature on feed intake, feed conversion and body

of canned cooked meats; the ban on imports of cattle from the U.S.A., later extended to cattle, sheep and goats from all countries because of the fear of introducing BLUETONGUE; the prohibition on the import of egg noodles and the stomachs of animals (used for rennet manufacture) from all countries except New Zealand; the importation of fertilizers and stock feed derived from whales, and of animal foods of plant origin. AFRICAN HORSESICKNESS, CHRONIC RESPIRATORY DISEASE, HAEMORRHAGIC SEPTICAEMIA, LUMPY SKIN DISEASE and MUCOSAL DISEASE COMPLEX were declared to be diseases of animals for purposes of the Quarantine Act.

Importations subject to quarantine were domestic animals from Great Britain and Ireland, New Zealand (types and numbers are listed), laboratory animals (including monkeys) for scientific institutions and vaccine manufacture, queen bees, aquarium fish, animals for zoos and circuses, and certain goods of animal origin.

The number and types of animals exported are listed. Many of the cattle went to the Philippines for slaughter; most of the sheep went to Singapore and the goats to Malaya and Ceylon. Great Britain imports stud cattle from Australia subject to rigid health certificates.

Other matters mentioned include ships' pets and items of quarantine risk arriving with migrants or by post, and delegations to conferences.—N. WICKHAM.

— (1960). Regulatory veterinary medicine. Special report on State and Federal Services.

—Agric. Handb. U.S. Dep. Agric. No. 167 pp. 217.

3070

This collection of 31 papers by various authors is an illustrated account of the role of veterinary surgeons in the prevention, control and eradication of disease of livestock and in the supervision of foodstuffs of animal origin in the U.S.A. It ends with a chronology of veterinary regulations extending from 1833-1959.—R.M.

temperature of beef cattle in two types of stall.]—Acta vet. Acad. Sci. hung. 10, 69-82. [In German.]

3071

Observations were made on heifers and bullocks in 2 types of buildings over 191 days, including an unusually hot June-July. Body

temperature increased when the environmental temperature exceeded 20°-25°C., a hyperthermic condition (41.7°C.) commencing at an ambient 30°C. Food intake and conversion were greatly reduced at higher temperatures; forced ventilation is recommended above 25°C. and each animal should have at least 20 cu. metre space.—E.V.L.

Andrews, F. N., Fontaine, W. E., Culver, A. A., Noffsinger, T. L. & Garwood, V. A. (1960). Effectiveness of various types of shade on the growth of swine in a normal summer environment. — *J. Anim. Sci.* 19, 429-433. [Authors' summary modified.] 3072

Comparisons were made of five roof materials: straw, plywood, corrugated steel, aluminium and laminated polyethylene plastic. There were no differences as between materials and no measurable effects of roof colour, in-

cluding white, red and black upper surfaces, and combinations of painted upper and lower surfaces, on rate of gain of pigs.

Culver, A. A., Andrews, F. N., Conrad, J. H. & Noffsinger, T. L. (1960). Effectiveness of water sprays and a wallow on the cooling and growth of swine in a normal summer environment.— *J. Anim. Sci.* 19, 421-428. [Authors' summary modified.] 3073

In control pigs at rest beneath an open shade with a painted white wooden roof, rectal temperature and respiration rate rose with increasing ambient temp. The use of a wallow reduced the rise in respiration rate, but was not as effective as a spray, especially at temp. above 83° F. The pigs having access to a mist-type spray had no appreciable rise in either respiration rate or rectal temp. over a range of 73° to 88° F. in ambient temperature.

REPRODUCTION AND REPRODUCTIVE DISORDERS

Jakobsen, K. F. & Mann, T. (1960). Biochemical appraisal of a milk diluent for semen.— *J. agric. Sci.* 54, 166-169. [Authors' summary modified.] 3074

A milk diluent for bull, ram and boar spermatozoa was studied. Respiration and fructolysis of spermatozoa were criteria of sperm activity. The diluent was a standardized and commercially available preparation of sterilized and homogenized milk, supplemented with milk fat.

Oxygen uptake measured manometrically in the presence of air was increased by the addition of the milk diluent throughout the entire incubation period. Fructose utilization was assessed by the rate of lactic-acid production. The rate of the anaerobic lactic-acid formation was higher in the presence of the diluent during the later stages of incubation.

The effect of the diluent on sperm respiration was most striking with the sperm-rich portion of boar ejaculate. A less marked effect was observed with bull semen, and in ram semen the effect was comparatively weak.

Cupps, P. T., Laben, R. C., Rahmann, D. F. & Reddon, A. R. (1960). Effects of adrenal glucocorticoids and testosterone on the semen. — *J. Anim. Sci.* 19, 509-514. [Authors' summary modified.] 3075

Cortisone acetate and hydrocortisone acetate increased spermatozoa concentration and total number per ejaculate, and decreased the fructose conc. in 5 of 7 bulls. Motility,

percentage live, and citric acid conc. were not changed. Of seven normal rabbits treated with cortisone acetate and hydrocortisone acetate, spermatozoa conc. increased in four, was unchanged in two, and decreased in one. Of four adrenalectomized rabbits, sperm conc. was increased in three and decreased in one. Fructose conc. was increased in both normal and adrenalectomized rabbits.

Corticosterone had no effect on spermatozoa and fructose conc. in normal or adrenalectomized rabbits.

Testosterone increased citric acid concentration in the semen of four of five bulls. Sperm concentration was decreased in all five bulls, but only in one was the decrease statistically significant.

Supplementary glucocorticoids caused changes in semen characteristics similar to those found in bulls with fascicular adrenal tumours and hypertrophy of the fascicular-reticular zones.

Blom, E. & Birch-Andersen, A. (1960). The ultrastructure of the bull sperm. I. The middle piece.— *Nord. VetMed.* 12, 261-279. [In English. Summaries in German and Danish.] 3076

After examining thin sections of spermatozoa under the electron microscope, the authors described the structure of the axial filament, implantation region, cell membrane, mitochondrial sheath and terminal ring [15 photomicrographs].—R.M.

Calaprice, A. & Dello Joio, T. (1960). Sulla temperatura dello sperma del toro all'atto dell'emissione. [Temperature of bull's semen at the time of ejaculation.]—Acta med. vet., Napoli 5, 539-545. [Summaries in English and French.] 3077

The apparatus used for collecting bull's semen and recording its temperature is described. At the time of ejaculation the temperature of the semen was 26°-30°C., and not 37°-38° as stated by other workers; beyond certain limits, the temperature of the water in the artificial vagina may affect that of the semen.—T.E.G.R.

Wales, R. G. (1959). The differential staining of human and dog spermatozoa.—Aust. J. exp. Biol. med. Sci. 37, 433-440. [Author's summary modified.] 3078

Human spermatozoa can be stained successfully with trypanblue, eosin and erythrosin and although each stain gives a difference in the estimate of "live" cells in a sample, this difference is consistent for each ejaculate, before and after heat treatment.

It is suggested that because of the relative simplicity of the procedure, eosin-nigrosin should be used routinely to stain human spermatozoa.

Eosin-nigrosin should be used in preference to Congo red-nigrosin as a vital stain for dog spermatozoa as it gives better differentiation, a variance estimate more consistent with that expected from theory, and less difference between operators.

With both dog and human spermatozoa the percentage of stained cells in a semen-eosin mixture increased with time of exposure to the stain.

Lake, P. E. (1960). Studies on the dilution and storage of fowl semen.—J. Reprod. Fertil. 1, 30-35. [Author's summary modified.] 3079

Fowl semen was diluted 1:3 and stored at 0 to 2°C for 24 and 48 hours. The diluents were two modifications of a glutamate-containing saline solution calculated to have an osmotic pressure equivalent to 0.98 to 1% NaCl soln. The concentrations of sodium, potassium, magnesium and glutamate in the diluents were of the same order as those found in seminal plasma uncontaminated with cloacal gland fluid. Calcium was not added and the chloride conc. was low compared with undiluted seminal plasma. One modification of the diluent contained added fructose and the other was fructose-free.

Pullets were inseminated with 0.1 ml. of the diluted semen. The proportion of fertile eggs laid by all pullets from the 2nd to the 6th day after insemination with semen stored for 24 and 48 hours in the solution containing fructose was 64 and 47% respectively. Fertility was significantly lower with semen stored in the fructose-free soln.

Kamar, G. A. R. (1960). Studies on fowl sperm. I. Viability of fowl sperms after storage. II. Seasonal variation in sperm abnormalities.—Emp. J. exp. Agric. 28, 16-22. [Author's summary modified.] 3080

The percentage of live spermatozoa declined slightly after storage of undiluted semen for 72 hours at 4°C. when collected without milking the copulatory organ. The decline was greater in summer than in winter.

The percentages of different forms of abnormal spermatozoa varied with the seasons. Head abnormalities were most prevalent in winter and tail abnormalities were commonest in summer.

Beatty, R. A. (1960). Fertility of mixed semen from different rabbits.—J. Reprod. Fertil. 1, 52-60. [Author's summary modified.] 3081

(1) Mixed insemination of known numbers of spermatozoa from two rabbits produced, spermatozoon for spermatozoon, offspring in the ratio of 1:5. This difference in spermatozoa fertility was highly significant, and consistent over four experiments. It is thought to be a consequence of, and in turn a useful measure of, differences in the viability of spermatozoa in the original ejaculates. Such differences may be of common occurrence, and their existence would not necessarily be suspected from the records of natural matings. (2) The conception rate, or percentage of inseminations yielding a litter, was shown in one experiment to increase with the number of males contributing to the inseminate, even though the nett total number of spermatozoa per inseminate was held constant. These observations are not fully conclusive, but are presented as a finding of the type expected by Russian workers. (3) Inseminates from one particular male alone gave no offspring, but offspring fathered by this male appeared after mixed insemination, as if the fertility of its spermatozoa had been assisted by the admixture with other semen.

Braden, A. W. H., Lamond, D. R. & Radford, H. M. (1960). The control of the time of ovulation in sheep.—Aust. J. agric. Res. 11, 389-401. [Authors' summary.] 3082

Synchronization of ovulation in ewes during the breeding season was achieved by a 14 day course of progesterone injections followed by injections of pregnant mare serum gonadotrophin (PMS) and human chorionic gonadotrophin (HCG). Optimal control was attained when the PMS was given at the time of the last progesterone injection and the HCG 24 hr later. With this treatment most ovulations occurred between 20 and 28 hr after the HCG injection. However, none of the ewes exhibited oestrus at this time. Greater variability in the time of ovulation was found when the progesterone-PMS and PMS-HCG intervals were 0 hr and 48 hr, or 24 hr and 24 hr, and with these treatments about 80 per cent. of the ewes exhibited oestrus just before ovulation. On the 0-48 hr treatment schedule with artificial insemination 3-7½ hr after the HCG injection, 13 of 22 ewes had fertilized eggs or embryos when killed 3 or 35 days later.

Watson, R. H. & Radford, H. M. (1960). **The influence of rams on onset of oestrus in Merino ewes in the spring.** — Aust. J. agric. Res. 11, 65-71. [Authors' summary modified.] 3083

Ewes which had been well separated from rams were permitted varying degrees of association (smelling, hearing, seeing, and actual contact) with rams for two weeks. These ewes, along with others which had remained well separated from rams during the same period, were then run together with raddled vasectomized rams continuously.

Almost all ewes experienced oestrus during the following 26 days, but most ewes which had been associated with rams experienced it first. The results in all groups which were associated with rams were similar, irrespective of the nature of the association. It was concluded that rams had a stimulating influence on the onset of oestrus after anoestrus in the spring, and that smell and sound gave sufficient stimulus.

Shelton, M. (1960). **Influence of the presence of a male goat on the initiation of estrous cycling and ovulation of Angora does.** — J. Anim. Sci. 19, 368-375. [Author's summary modified.] 3084

The presence of the male with the does just before the start of the breeding season stimulated the initiation of oestrus and ovulation. In slaughter studies 15 of 17 does which had run with males for 10 days had ovulated as compared with 1 of 17 in a control group. In breeding studies with 63 does,

exposure of one group to a vasectomized male beginning 10 days before the start of the breeding season resulted in a significant difference in the mean kidding date between them and a control group. A grouping of births was observed in both the stimulated and control group, but the characteristic time lag experienced with the breeding flock in earlier years was absent from the control group. This fact suggests that possibly other factors as well as the presence of the male may serve to initiate and synchronize breeding activity of the does.

Sherman, J. K. & Steinberger, E. (1960). **Effects of triethylenemelamine on reproductive capacity of mouse spermatozoa.** — Proc. Soc. exp. Biol., N.Y. 103, 348-350. [Authors' summary modified.] 3085

Triethylenemelamine (TEM) injected intraperitoneally reduced the reproductive capacity of male mice by acting on and through spermatozoa without altering their number, motility, or appearance. Females artificially inseminated with spermatozoa from the ductus deferens and cauda epididymidis of treated males had lowered fertility as well as litter size. Spermatozoa appeared more sensitive to TEM than late spermatids. No obvious structural changes were induced in testicular elements during treatment. Motility of spermatozoa was unchanged by exposure to a high concentration of TEM.

Bruce, H. M. (1960). **A block to pregnancy in the mouse caused by proximity of strange males.** — J. Reprod. Fertil. 1, 96-103. [Author's summary modified.] 3086

Pregnancy and pseudopregnancy both failed in a high proportion of mice when the recently mated female was housed with or near strange males, particularly males of a different strain, or with a castrated male. In these circumstances, the female returned to oestrus 4 to 5 days after the original mating and implantation did not take place.

The use of genetically marked test males of a different strain from the stud males showed that superfoetation did not occur.

By contrast, pregnancy was not blocked when the female was returned to her own stud male after being separated from him for 24 hours, or when she was kept in the presence of other females. The evidence suggests that the presence of other females may even help towards stabilizing a pregnancy.

The histology of the ovaries from females having blocked pregnancy showed a varying

degree of pituitary-gonadotrophin stimulation. The fate of the blastocyst from the first mating remains as yet undetermined.

Jones, E. C. & Krohn, P. L. (1960). **The effect of unilateral ovariectomy on the reproductive lifespan of mice.**—*J. Endocrin.* 20, 129-134. [Authors' summary.] 3087

Although unilaterally spayed mice can produce litters almost as large as those produced by normal mice, their reproductive lifespan is curtailed and the total number of offspring born is about halved.

Perry, J. S. (1960). **The incidence of embryonic mortality as a characteristic of the individual sow.**—*J. Reprod. Fertil.* 1, 71-83. [Author's summary modified.] 3088

Embryonic mortality was estimated by comparing the number of piglets born with the number of corpora lutea counted at laparotomy early in pregnancy. A non-random distribution of embryonic loss was found in the first pregnancy in 36 animals; it was apparently related to the parentage, particularly to the sire, of the pregnant female.

The same estimation was subsequently carried out in two or more successive pregnancies in each of 16 sows, from the progeny of two unrelated males and four females, each male having served two of the females and each female being the dam of four of the test animals. The latter were mated alternately with two young males. The half-sister groups differed significantly with regard to the percentage mortality among their embryos; the full-sister groups within them differed, but not significantly, and the mortality was quite independent of the male with which they were mated.

It appears that the individual sow is liable to a characteristic incidence of embryonic loss in successive litters.

Savard, K. & Goldzieher, J. W. (1960). **Biosynthesis of steroids in stallion testis tissue.**—*Endocrinology* 66, 617-624. [Authors' abst. modified.] 3089

The testis of a gonadotrophin-stimulated stallion was perfused with horse blood containing sodium acetate-1-C¹⁴ for 24 hours. The neutral lipide fraction yielded the following radiochemically pure substances: 4-androstene-3,17-dione, testosterone, progesterone and 17-hydroxyprogesterone. The high level of isotope incorporated into the above steroids is interpreted as reflecting a relatively great steroidogenic capacity of stallion testicle.

Short, R. V. (1960). **Steroids present in the follicular fluid of the mare.**—*J. Endocrin.* 20, 147-156. [Author's summary modified.] 3090

Using paper chromatographic techniques, seven steroids were identified in the follicular fluid. Epitestosterone was identified as a natural product for the first time, and its possible significance is discussed. 19-Hydroxyandrostenedione, the postulated intermediate in the formation of oestrene from androstenedione, was not detected and doubt is cast on the theory that it is an essential intermediate in the biosynthesis of the ovarian oestrogens.

Relatively large amounts of an unidentified polar oestrogen were present in follicular fluid.

Kristoffersen, J. (1960). **Gestogens in corpus luteum of cattle.**—*Acta endocr. Copenhagen* 33, 417-427. [In English.] 3091

The progesterone content in µg. per g. tissue was determined for six corpora lutea from non-pregnant cows and for 21 from cattle at various stages of pregnancy. Mean values of 20.7 µg. were obtained in the non-pregnant group. 5 cows less than two months pregnant gave values up to 10 µg.; the mean value for 7 cows 3-5 months pregnant was 12.2 and for 8 cows more than 5 months pregnant 5.0 µg., confirming previous work. Estimation was by a chemical-spectrophotometric method involving paper chromatography.—F. L. M. DAWSON.

Loy, R. G., Zimbelman, R. G. & Casida, L. E. (1960). **Effects of injected ovarian hormones on the corpus luteum of the estrual cycle in cattle.**—*J. Anim. Sci.* 19, 175-182. 3092

Only heifers with an oestrous cycle of from 17-25 days were used; a control corpus luteum was removed through the fornix on the 14th day; and after intervention of at least one normal cycle, 2 groups each of 10 heifers and a third including some cows, received respectively 1 mg./lb. progesterone on the fifth day of the cycle only, 250 µg. oestradiol 17 β from the 1st-13th day inclusive, and 1 mg./lb. progesterone on the day after heat only. Corpora lutea were again removed through the fornix on the 14th day or else at slaughter; assayed chemically for progesterone content, and content of type I and II luteal cells on Greenstein's classification estimated from sections. Progesterone from the day after heat reduced corpora weights, progesterone concentration and % functional luteal cells to about two-thirds of control

levels. Progesterone from the fifth day significantly reduced proportion of functional cells and hormone concentration (though to a less extent), without affecting weight. Oestradiol depressed the weight and percentage of functional cells without affecting progesterone concentration.

—F. L. M. DAWSON.

Spies, H. G., Zimmerman, D. R., Self, H. L. & Casida, L. E. (1960). **Effect of exogenous progesterone on the corpora lutea of hysterectomized gilts.** — *J. Anim. Sci.* 19, 101-108. 3093

Four gilts had the uterus removed on the 7th day of the cycle and were checked daily for heat, till slaughter at 32, 71, 72 and 119 days: in all, corpora lutea were normally maintained as in pregnancy. Four groups each of 8 gilts were served and slaughtered on the 25th day: (1) normal controls; (2) uterus removed on the 7th day; (3) intact, progesterone-supplemented from 10th day at 1 mg./lb./day; and (4) hysterectomized, progesterone supplemented from 10th day. Corpora lutea present at slaughter were analysed for progesterone content by Loy's chemical method. Their individual weights were, approximately, halved (as compared with other groups) in the groups injected with exogenous progesterone. Progesterone concentrations also were reduced, in supplemented groups, to about two-thirds. Uterine tissue transplant experiments provided no clue to the mechanism by which hysterectomy prolongs the life of the corpus luteum.

—F. L. M. DAWSON.

Spies, H. G., Zimmerman, D. R., Self, H. L. & Casida, L. E. (1960). **Maintenance of early pregnancy in ovariectomized gilts treated with gonadal hormones.** — *J. Anim. Sci.* 19, 114-118. 3094

36 gilts, averaging about 220 lb., in four groups were spayed 4 days after mating, when corpora lutea were counted. Daily dosage with progesterone/oestrone 4,000:1 began one day before spaying, groups receiving respectively 0.3, 0.6 and 1.2 mg. progesterone per lb. body wt. Animals were slaughtered at the 25th day. Percentage embryo survival as between 4 and 25 days was significantly lower (17-38%) in the treated groups than in the controls (86%). —F. L. M. DAWSON.

Vandeplasche, M. & Bouckaert, J. H. (1960). **Comite voor steriliteitsbestrijding Veeartsenij-school—Gent. Verslag over het werkjaar**

1959. [Committee for the control of sterility, Veterinary College of Ghent. Report for 1959.] — Vlaams diergeneesk. Tijdschr. 29, 54-64. [In Flemish. Summary in English.] 3095

Preputial secretion from a bull with acute pseudomembranous balanitis set up vaginitis in heifers and balanitis in bulls. The causal agent was grown in eggs and in cultures of bovine kidney cells. The incidence of trichomonas infection in bulls appeared to have increased during the past year. During the year 782 sows were artificially inseminated and half of them became pregnant. A warning was given that it was easy to mistake a ripe follicle for a corpus luteum upon rectal palpation of the cow's ovaries. The problem of critical evaluation of statistics concerning the fertility of different breeds of cattle was discussed.—R.M.

Wagner, W. C. & McEntee, K. (1960). **Herd approach to infertility problems in cattle.** — *Cornell Vet.* 50, 197-210. [Authors' summary modified.] 3096

The procedures for examining infertility problems in 87 New York dairy herds are discussed. An outline of a systematic investigation of a herd problem is presented. Far too often where herds had been visited, pregnancy examinations and examination of semen had not been carried out. No single factor should be incriminated, or excluded, as the cause of herd infertility until a thorough investigation has been made.

Murray, J. G. (1959). **Infertility in the cow and heifer.** — *Vet. Rec.* 71, 1128-1140. Discussion: pp. 1140-1144. 3097

The subject is discussed from the point of view of the practising veterinary surgeon against a background of recent specialist literature. The technique of clinical examination, including pregnancy diagnosis, is outlined. In the second section of the paper the pathology of each of the various parts of the genital tract is considered in some detail, as is also that of various types of functional infertility including failure to show heat, cystic ovarian disease, delayed ovulation, and congenital defects. The final section comprises recommendations on treatment. Murray emphasised that over-oestrinization of the uterus was an important cause of pyometra and raised the possibility that corpus luteum expulsion might raise the twinning rate to service at the induced heat [since confirmed by abstractor's experimental work].

In discussion, J. Pasfield had noted a marked seasonal incidence of infertility work, 23 cases occurring in the fourth quarter of the year as contrasted with 130 in the third. The proportion of endometritis cases remained constant at 40% all the year round. G. F. Smith questioned the value of infertility treatment in any circumstances.

—F. L. M. DAWSON.

Urbányi, L. (1960). Über den Wert von Blutuntersuchungen zur Feststellung der alimen-tär bedingten temporären Unfruchtbarkeit der Rinder. [Blood tests for temporary sterility of nutritional origin in cows.]—Acta vet. Acad. Sci. hung. 10, 155-164. [In German.] 3098

A German version of work previously published in Hungarian [V.B. 30, 2019].

—R.M.

McManus, T. J. (1960). Report of entropion in newborn lambs.—Aust. vet. J. 36, 91-92. [Author's summary modified.] 3099

An outbreak of entropion in the progeny of 600 ewes is reported. A simple method of surgical correction of the condition is described which proved entirely effective. The ethics of veterinary treatment of entropion in sheep are discussed briefly.

Pearce, L. & Brown, W. H. (1960). Hereditary premature senescence of the rabbit. I. Chronic form: general features. II. Acute

See also absts. 2977, 2978 (effects of nutrition); 2988 (amino-acid deficiency).

ZOOTECHNY

Story, L. F. & Ross, D. A. (1960). Effect of shearing time on wool. VI. The rate of growth of wool and its relation to time of shearing.—N.Z. J. agric. Res. 3, 113-124. [Author's summary modified.] 3101

Monthly measurements have been made of wool, grease, and suint production, and fibre diameter and length, in Romney ewes shorn before and after lambing. The growth of wool is three times faster in summer than in late winter-early spring and the minimum rate decreases and occurs later with increasing number of lambs. Wool obtained before lambing is sound because it is shorn near the time when fibre diameter at the butt is at a minimum, and wool shorn at any other time has a thin region some distance up from the butt.

Green, H. F. (1960). Some hide and skin curiosities.—J. Soc. Leath. Tr. Chem. 44, 83-88. [Author's summary.] 3102

form: general features.—J. exp. Med. 111, 485-503 & 505-515. [Authors' summaries modified.] 3100

I. Hereditary premature senescence in a family of Belgian hares belonging to a rabbit-breeding colony is described. Representatives of 20 generations of the complex have been studied. The condition was a degeneration of variable degrees of severity with two principal forms, acute and chronic, the chronic being the more frequent. The chronic form is described in terms of the main local or external manifestations, i.e., degeneration of the coat and skin, lesions of the eyes and feet, and reproductive abnormalities, and of the general deterioration which in severe cases was progressive and characterized by muscle wasting, fat reduction, emaciation, weakness and death.

II. In the acute form of hereditary premature senescence in 79 rabbits, including some of the 20th generation of the condition, the manifestations did not differ from those previously described for the chronic form but their degree and the severity and rate of progression of degeneration were much greater. The rabbits either did not survive to 2½ years of age or their physical condition had become critical by this time. A senile appearance, largely due to changes in the coat, was frequently observed. The condition was essentially a degeneration involving vital mechanisms essential to the maintenance of health.

A number of hide and skin curiosities found in Kenya are described and illustrated. They comprise examples of attack on hides by tick-birds, ants and the case-making clothes moth, hyperkeratosis of hides, penetration of sheepskin by stick-grass thorns, unusual hair growth on hides associated with photo-sensitization, unusual hair follicle grouping in camel hides, how demodicosis in dogs differs from that in cattle and goats and how the blemishes found on hides from cattle which have recovered from lumpy skin disease resemble those on sheepskins and goatskins after recovery from pox.

Dempsey, M. (1960). Dermal surface of sheep-skin.—Nature, Lond. 185, 860-861. 3103

Unsightly spots on the grain surface of some leathers are caused by small 'tongues' of tissue on the skin surface which rub off during processing.—E.V.L.

Mimura, K. & Asahida, Y. (1959). The environmental factors on the lamb growth, analytically studied with extra-seasonal lambs. I. Extra-seasonal-production of lambs by artificial light treatment.—J. Fac. Fish. Anim. Husb. Hiroshima Univ. 2, 365-374. [In English.] 3104

Eighteen Corriedale ewes were exposed to lengthening periods of light for up to 2 weeks. When the periods corresponded to the summer solstice, they were diminished for 3-8 weeks until the equivalent of the winter solstice was reached, when they remained constant. Oestrous cycles commenced in all the ewes outside the normal breeding period. The period between the onset of shortening days and first oestrus was 40-50 days. When run with a ram, all of 13 ewes failed to conceive at first oestrus, but they became pregnant after a subsequent mating. Five of the 14 lambs born were small and weak.—M.G.G.

McKenzie, D. A., Lambert, J. & Getty, J. (1959). Studies on aerosol disinfection of poultry premises.—J. appl. Bact. 22, 258-263. [Authors' summary modified.] 3105

A study has been made of the effectiveness of a mixture of chloroxylenol and triethylene glycol for either atmospheric or surface disinfection in poultry premises. Only a moderate bactericidal action was obtained with atmospheric disinfection using *E. coli* as the test organism. With a stronger mixture, a complete kill was obtained for surface disinfection with overnight exposure but the reduction in numbers of the test organisms with 30 min. exposure did not exceed 75% in any experiment. Very satisfactory results were obtained with a formalin-water aerosol.

I. Myktywycz, R. (1959). Social behaviour of an experimental colony of wild rabbits, *Oryctolagus cuniculus* (L.) II. First breeding season.—C.S.I.R.O. Wildlife Res. 4, 1-13. 3106

II. Myktywycz, R. (1960). Social behaviour of an experimental colony of wild rabbits, *Oryctolagus cuniculus* (L.) III. Second breeding season.—Ibid. 5, 1-20. 3107

I. This paper continues the study of a colony [V.B. 19, 1629] during the first breeding season (June to December 1957). The dominant doe littered at regular monthly intervals, and others less frequently. The survival rate (56%), and growth rate of kittens of the dominant doe were higher than of other kittens. The growing population split

into separate groups each with its own dominant pair and territory. Climate was the major factor in controlling population numbers, and avian predation second in importance. There was no indication of a controlling role by *Eimeria* or other pathogenic micro-organisms.

II. The 67 survivors from the first breeding season, including 36 does, formed eight groups, each with its own dominance-hierarchy, and group territory. Dominant does bred more successfully than others, and their kittens had higher survival rate. Pasture deterioration appeared to be the most important factor influencing kitten mortality. *Staphylococcus aureus* and *Pasteurella septica* were isolated from adults which died during the season.—A. CULEY.

Myers, K. & Poole, W. E. (1959). A study of the wild rabbit, *Oryctolagus cuniculus* (L.), in confined populations. I. The effects of density on home range and the formation of breeding groups.—C.S.I.R.O. Wildlife Res. 4, 14-26. [Abst. from authors' summary.] 3108

Adult rabbits in confined populations inhabit a well-defined home range. The average area of home range becomes smaller as rabbit numbers increase, and the home ranges of adult females are smaller than those of adult males.

Rabbits form small groups during the breeding season, usually consisting of two or three males and three or four females. A strict dominance-hierarchy is established among the males.

Poole, W. E. (1960). Breeding of the wild rabbit, *Oryctolagus cuniculus* (L.) in relation to the environment.—C.S.I.R.O. Wildlife Res. 5, 21-43. [Abst. from author's summary.] 3109

Shot samples of rabbits were obtained in 1954 and 1955 from two sites in different climatic areas of New South Wales, and the reproductive organs were examined histologically. The reproductive pattern was found to be influenced by environmental factors, such as the incidence of rain, and the response of vegetation to it. There was evidence of considerable pre-natal loss of litters. Outbreaks of myxomatosis occurred in both sites during the period of study. The fertility of bucks was reduced for a few months after recovery but there was no evidence to show that the fertility of recovered does was affected.

TECHNIQUE AND APPARATUS

Iggott, W. R. & Emmons, C. W. (1960). Device for inhalation exposure of animals to spores.—Proc. Soc. exp. Biol., N.Y. 103, 805-806. [Authors' summary modified.] 3110

A culture flask with 10 side arms is converted by insertion of a unit for blowing air across a fungus culture into an exposure chamber. Ten mice or other animals can be exposed simultaneously with minimal contamination to an atmosphere containing dry spores. The design can be adapted to exposure of larger animals and to use with dusts, mists and gases. Advantages of the device are: it is small and portable, simple in construction and operation, it is a closed system, and contamination of fur of animals is minimal.

Ulton, F. (1960). Tissue culture on polythene.—J. gen. Microbiol. 22, 416-422. [Author's summary.] 3111

Fragments of solid organs can be squashed, without destroying the viability of the cells, to form a thin sheet of cells which is stuck to polythene film with clotted mouse plasma. The film conveniently floats on a simple culture medium in which embryonic tissues multiply within 24 hr. and adult tissues survive for several days. The tissue on the polythene is thin enough to mount on a microscope slide and examine with phase-contrast illumination and an oil-immersion objective; alternatively, since the polythene is inert to most organic solvents, the tissue can be stained and mounted, using standard histological techniques. The squashed tissue on polythene is more readily infected by viruses and more easily examined than are fragments of tissue embedded in plasma on a coverglass. The method was used to study one virus cytopathogenic for many chick tissues and another virus detected by the haemadsorption phenomenon.

Berman, I. & Kaplan, H. S. (1959). The cultivation of mouse bone marrow in vivo.—Blood 14, 1040-1046. [Interlingua summary.] 3112

Bone marrow cells in diffusion chambers implanted into the peritoneal cavity of mice continued to undergo differentiation and retained their morphological identity for a long time.—T.E.G.R.

Evans, A. S. (1960). Immunophysical methods in parasitic infections: a continuous electro-

phoresis apparatus for preparative fractionation of protein systems.—Exp. Parasit. 9, 105-112. [Author's summary modified.] 3113

A continuous preparative electrophoresis apparatus is described. It has proved to be a practical instrument for the physical isolation of electrophoretically homogeneous subfractions of complex protein systems for extensive analytical and immunological studies. The procedure, developed for the study of antigen-antibody systems in parasitic diseases, is also suitable for preparative fractionation of lower molecular weight substances. The advantages of the instrument are discussed.

Seniów, A. (1959). Nowy prototyp komory do mikroelektroforezy bibułowej białek w płynach ustrojowych. [A new chamber for paper microelectrophoretic analysis of proteins in body fluids.]—Weterynaria, Wrocław No. 6 pp. 131-136. [In Polish. Summaries in English and German.] 3114

A description of a device in which the electrode containers hold and stretch the strips of filter paper.—M. GITTER.

Budtz-Olsen, O. E., Dakin, H. C. & Morris, R. J. H. (1960). Method for continuous urine collection from unrestrained wethers and other large animals.—Aust. J. agric. Res. 11, 72-74. [Authors' summary.] 3115

Simple equipment is described by which accurately timed, continuous collection of uncontaminated urine from freely mobile wethers may be carried out.

Jackson, J. B., Radeleff, R. D. & Buck, W. B. (1960). Multicatheterization of blood vessels of sheep for metabolic studies of insecticides.—J. Amer. vet. med. Ass. 136, 440-443. [Authors' summary modified.] 3116

A surgical procedure for catheterizing the hepatic, portal and renal veins and the renal artery and gall-bladder of sheep has been devised, which permits study of chemicals in blood passing from the digestive tract to the liver, from the liver to the heart, and entering and leaving the kidney. These samples, plus the bile, may then be compared with peripheral blood.

This procedure should enable better understanding of insecticide metabolism and may be applied to nutritional studies.

Survival of sheep is to be expected in all cases.

REPORT

India. (1959). Annual Report of the Indian Council of Agricultural Research for 1955-56. pp. 196. Delhi: Govt. of India press. Rs. 5.00 or 8s. Od. 3117

Of the 76 outbreak strains of FOOT AND MOUTH DISEASE virus typed so far, 28 were Vallée O, 16 an O variant; 6 Vallée A, 16 an A variant; 2 Waldmann C, 5 a C variant; and 3 atypical. Animals vaccinated with crystal violet vaccine (bivalent, types O and A) were immune to challenge for 10½ months. Belin's vaccine, received from France, failed to protect bulls against the disease; and papagen preparations (German) and 'anavirus antiaphteux' received from Paris had no prophylactic or curative effect in g.pigs.

Staphylococci were the commonest cause of bovine MASTITIS. The other organisms isolated were *Streptococcus agalactiae*, *Str. dysgalactiae*, *Str. uberis*, *Corynebacterium pyogenes*, and yeast-like organisms. Of the indirect tests, the leucocyte count gave the highest correlation (86%) with the cultural test. Six of 8 cases of clinical *Staph. aureus* mastitis were cured with a mixture of procaine penicillin, dihydrostreptomycin, sulphadimidine, and cobalt sulphate, injected i/m on 4

successive days.

All 6 cultures of *Mycobacterium tuberculosis* isolated from human extrapulmonary TUBERCULOSIS conformed to the human type. The vole bacillus showed no cross allergy with, and afforded no protection against, *M. johnei*. ENTEROTOXAEMIA (*Clostridium welchii*, Type D) was again diagnosed in sheep.

In the RINDERPEST eradication programme, 5,299,499 cattle and buffaloes were vaccinated up to the end of March 1956.

Analysis of animal feeds at various places revealed subnormal copper intake, and the blood of calves in West Bengal and liver of buffaloes and goats in slaughterhouses at various places showed subnormal copper values. Similarly, the haemoglobin content of the blood of calves at many places was rather low.

To make more veterinary graduates available for the development plans, 4 new veterinary colleges were started, the annual admission capacity of the existing colleges was increased permanently, and double shifts were introduced. In addition, an emergency two-year course was started.—R. N. MOHAN.

BOOK REVIEWS

Whitlock, J. H. (1960). Diagnosis of veterinary parasitisms. pp. 236. London: Henry Kimpton. 75s. 3118

The aims of the author are clearly indicated in the first sentence of the Preface, which reads, "This handbook is designed to aid the veterinary pathologist, practitioner or student, to identify the common parasites of domestic animals, and to provide an introduction to the relevant literature." Further he writes, "It will serve its purpose if it moves with the student from the laboratory course to the clinical laboratory of the practitioner."

It would seem that in his enthusiasm for his subject the author has tended to lose sight of his original aims; for instead of a manual consisting mainly of keys, descriptions and diagrams, to which ready reference can be made when attempting to identify a parasite, he has written what is essentially a textbook of Veterinary Entomology and Helminthology incorporating a number of keys and descriptions, more suited to the study than the laboratory.

The arrangement of the chapters is based on Phyla, Orders and Superfamilies; this does

not facilitate using the book when endeavouring to identify some unknown specimen; neither does the fact that many pages of text are devoted to various aspects of the biology of the parasites, although this information is of considerable interest and presented in a readable manner.

In general the keys are adequate for a generic diagnosis only, and the descriptions are not always as full as they might be. The text is amply illustrated with both diagrams and photographs. The latter although very decorative are limited in their usefulness as aids to identification owing to the lack of detail.—J. H. ROSE.

Arthur, D. R. (1960). Ticks: a monograph of the Ixodoidea. Part V. On the genera *Dermacentor*, *Anocentor*, *Cosmiomma*, *Boophilus* and *Margaropus*. pp. xvii + 251. Cambridge: University Press. 60s. 3119

The first four parts of this monograph appeared between 1908-1926 (*Argasidae* and the genera *Ixodes*, *Haemaphysalis*, *Amblyomma*). Five genera are covered in the present volume and parts VI and VII

(*Rhipicephalus*, *Rhipicentor*, *Hyalomma*) will complete the work.

Thirty pages and all four photographic plates are devoted to the morphology and anatomy of *Dermacentor*, and there are over 500 excellent line text figures. Each genus has a section on synonymy, literature, iconography and diagnostic characters, with keys to the males and females of *Boophilus* and *Dermacentor*. Notes on the biology and relationship to disease are given for most species.

This book is sure to become an essential reference for all those who are interested in the study of ticks.—W. N. BEESLEY.

Riley, J. F. (1959). *The mast cells*. pp. x + 182. Edinburgh (& London): E. & S. Livingstone Ltd. 30s.

3120

The function of tissue mast cells, which had been first described by Ehrlich in 1877, remained a puzzle to histologists and physiologists for some sixty years. It was then shown that they were the site of formation or of storage of heparin, and this fact, along with the occurrence of mast cells near small blood vessels, seemed to account sufficiently for their function. However, recent studies by Dr. Riley and his colleagues, following on their observation that these cells have an important content of histamine, have directed attention to their possible role in histamine release in tissues. Eventually, it may be found that the cells have a still more general role in a functional cycle of connective tissues involving also the ground substance and the fibroblast.

In the first part of this well-illustrated and well-produced book, the literature up to 1950 is reviewed in five chapters headed respectively: The discovery of the mast cells; the mast cell in evolution; the blood mast cell, basophil or mast leucocyte; mast cells in pathological conditions; the mast cell and heparin. In the second part of the book, the experimental work carried out by Dr. Riley and his colleagues is reported in detail in twelve chapters headed respectively: Introduction (the mast cell and carcinogenesis; the problem of the shocked dog); detailed distribution of mast cells in cattle and in the rat; the effects of histamine-liberators on the mast cells of the rat; histamine in tissue mast cells: normal tissues; histamine and heparin in tissue mast cells; pathological conditions including mast-cell tumours from domestic animals; the effects of a specific histamine liberator, compound 48/80, on the mast cells of the rat; the

effects of the same histamine-liberator on two different species, mouse and rat; binding of histamine in the mast cell; the nature of the mast-cell granule; non-mast cell histamine: the high histamine content of the pyloric mucosa; the function of heparin; mast cells and histamine in the skin; general discussion: functions of the tissue mast cells.

In the veterinary field, interest in mast cells has grown with the increasing reports of mast-cell tumours in dogs, and this book will be of great interest to veterinary pathologists and histologists. Some of the work has been published in separate scientific articles, but it is very useful to have the whole subject dealt with in one book, and to see the work described and the arguments deployed in such a masterly fashion.—E. COTCHIN.

Jacquot, R., Le Bars, H. & Simonnet, H. (1960). *Nutrition animale: biologie, physiologie et alimentation rationnelle*. Volume II. Tome I. *Données générales sur la nutrition et l'alimentation*. [*Animal nutrition Volume II, Part I.*] pp. xi + 473-963. Paris: Baillière et Fils. Fr. 5000 (NF 50).

3121

Animal nutrition is being dealt with in 10 volumes to be published in the "New Agricultural Encyclopaedia." This book is the first of the 2 parts of which the second volume consists. It is made up of 5 chapters of which the first deals with metabolism in general, the next 3 with the metabolism of sugars, fats and proteins respectively and the last with water and mineral matter. Like its predecessor, it is paper bound and has the table of contents at the end of the text.—T.E.G.R.

Newell, F. W. [Edited by.] (1960). *Glaucoma. Transactions of the fourth conference, March 8, 9, and 10, 1959, Princeton, N.J. [Sponsored by the Josiah Macy, Jr. Foundation.]* pp. 257. New York: Josiah Macy, Jr. Foundation. \$8.00.

3122

The conference concentrated on the fine structure of the trabecular apparatus and the ciliary epithelium in the normal state and in glaucoma in man, monkeys and laboratory animals.—R.M.

—. (1960). *New and nonofficial drugs: an annual compilation of available information on drugs, including their therapeutic, prophylactic and diagnostic status, as evaluated by the Council on Drugs of the American Medical Association, 1960*. pp. xxviii + 768. Philadelphia (& Montreal): J. B. Lippincott Co. [London: Pitman Medical Publishing Co. Ltd.] 30s.

3123

This annual provides detailed information about the action and uses of drugs that have been approved by the American Medical Association but have not been admitted to the Pharmacopeia of the United States, The National Formulary, or to New and Non-official Drugs. New arrivals include 3 antibiotics (amphotericin B, erythromycin propionate, vancomycin); 3 antispasmodics (caramiphen hydrochloride, cyclandelate, valethamate bromide); duck-embryo rabies vaccine; a chelated iron compound (ferro-cholate); a sulphonamide for urinary tract infections (sulphamethoxypyridazine); three phenothiazine-type ataractics (thiopropazate hydrochloride, triflupromazine hydrochloride, trimeprazine tartrate); cadmium sulphide skin dressing for seborrhoea; an anti-tussive (benzonatate); an anti-fungal agent (triaacetin); a detergent which has laxative action (poloxalkol). There are 81 more pages than the last edition [V.B. 29, 1978] but the price remains the same at 30s. which seems good value for the amount of information provided. A new feature is inclusion of the year of introduction of each drug. There is also a list of American drug manufacturers.—R.M.

Croft, P. G. (1960). *An introduction to the anaesthesia of laboratory animals.* pp. 31. London: The Universities Federation for Animal Welfare. 3s. 6d. 3124

This booklet is written for technicians and junior graduates who have had no previous experience of anaesthesia. After a description of injection technique and the choice of anaesthetic, there are sections on how to anaesthetize rabbits, guinea-pigs, hamsters, rats and mice. Selection of drugs is confined to ether, thiopentone sodium and pentobarbitone sodium. The emphasis is on simplicity.—R.M.

Stecher, P. G. [Edited by.] (1960). *The Merck index of chemicals and drugs: an encyclo-pedia for chemists, pharmacists, physicians, and members of allied professions.* pp. xi + 1641. Rahway, N. J.: Merck & Co., Inc. 7th edit. \$12.00. 3125

This new edition dwarfs the sixth edition of 1952. It contains about 10,000 descriptions of chemicals, one-third more than previously.

Veterinary uses of a given chemical are included when appropriate, together with doses. An innovation is the placing of all cross-references and synonyms into a separate "cross index of names" to which the reader must first refer in order to locate the required drug or chemical. There are numerous appendices giving information on chemistry, physics, weights and measures.

The index is invaluable to all who have to compare different names for the same substances or who have to find a concise description of a drug. It is therefore eminently suitable for all who have to deal with the many aspects of veterinary pharmacology, or with the literature on drugs. The price has been fixed to cover the cost of printing only and is very reasonable.—R.M.

Lerche, M., Bartels, H. & Kelch, F. [Edited by.] (1960). A. Schroeter/M. Hellrich. *Das Fleischbeschaugesetz nebst zusätzlichen Verordnungen und Gesetzen, mit Erläuterungen.* [Meat inspection law, with explanations. Part 1.] pp. viii + 218. Berlin (& Hamburg): Paul Parey. 7th edit. DM 22. 3126

The German laws on meat inspection have recently been revised and the new laws came into force in March 1960. The present volume is the first of four parts which will describe and explain the revised laws. Part II will appear in Summer 1960.—R.M.

Clayton, K. J. (1960). *Livestock insurance.* pp. v + 132. Stone & Cox Ltd. 15s. 3127

This book is a guide to underwriters engaged in the insurance of domestic animals, including dogs. Advice is given on the wording and conditions of policies covering losses through accident, diseases, electrocution, transport, third party liability, surgery and other risks. Errors, both of fact and of spelling, occur in the sections on diseases. The Hobday operation is confused with tracheotomy and parturient redwater with piroplasmosis. There is no such disease as "horn-distemper" of cattle. The book is of considerable interest to veterinary practitioners and owners of livestock since it reveals the kinds of policy that are available.—M.G.G.



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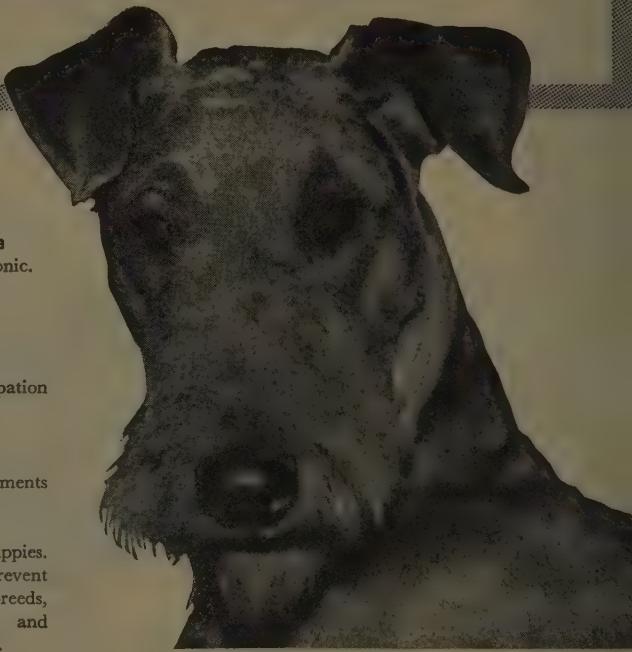


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